NETWORK WORLD

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3Com preps token-ring product suite

By Skip MacAskill
Staff Writer

SANTA CLARA, Calif. — 3Com Corp. last week introduced the first of a two-part product rollout intended to bolster its presence in the token-ring LAN market.

The company upgraded its NetBuilder bridge/router line to support full token-ring routing, additional protocols and more wide-area network services. That sets the stage for a major announcement this week of a next-generation token-ring hub and a line of token-ring local-area network interface cards.

These actions, coupled with 3Com's recent acquisition of hub maker BICC Data Networks, Inc. and its licensing of IBM's Advanced Peer-to-Peer Networking technology, position the company for a bold new push into the IBM LAN arena.

It remains to be seen, however, if 3Com can make an impact on the market. "One thing 3Com needs to prove is that it can support the token-ring environment," said Fred McClimans, program director at Gartner Group,

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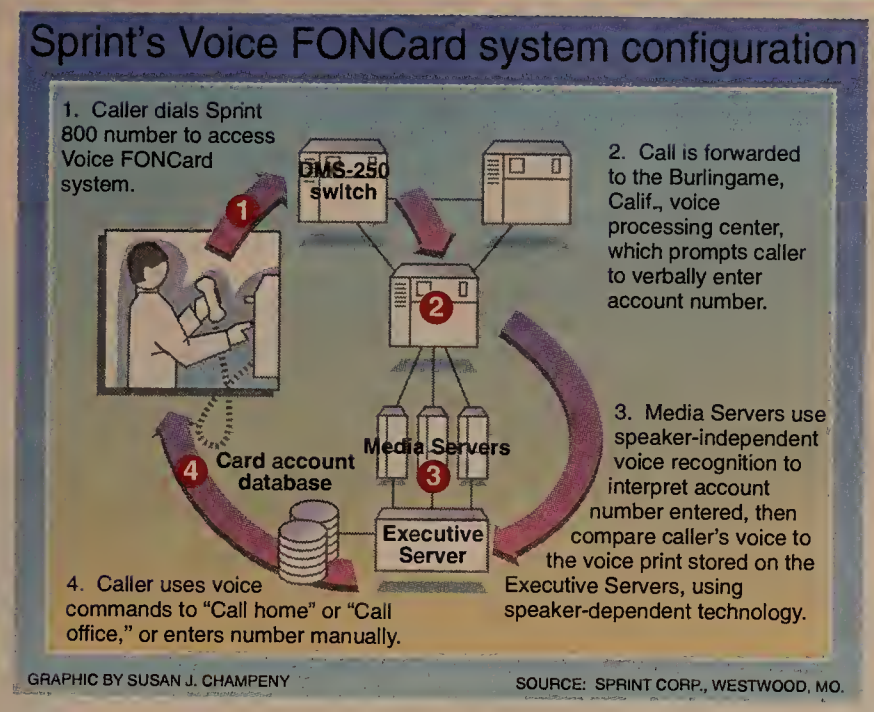

Voice-activated FONCard inches to the starting gate

First of a two-part article.

By Christopher Finn and Daniel Briere
Special to Network World

The concept of controlling your computer or telephone using verbal commands is still mostly the stuff of science fiction.

But developments in phrase recognition algorithms and digital signal processor technology have propelled some voice-activated applications into the mainstream, most recently with Voice FONCard from Sprint Corp.

TeleChoice, Inc., a consulting firm in Montclair, N.J., has been testing the Voice FONCard for more than two months to assess whether the voice-driven calling card service is ready for commercial release.

Volunteers used the card in a variety of environments, including a phone booth on Interstate 95, pay phones in noisy bars in New York and with a variety of cellular and speakerphones.

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Sybase bucks norm with new DBMS tools

Product set enhances distributed capabilities of SQL Server, offers alternative to two-phase commit.

By Timothy O'Brien
West Coast Bureau Chief

EMERYVILLE, Calif. — Sybase, Inc. is readying three products that will offer significant new distributed database capabilities for its SQL Server.

Among the products is the Replication Server, which will enable users to replicate data on servers across a network either in real-time or on an event-driven basis. The product represents an alternative to two-phase commit update technology and may minimize the strain on networks.

In addition, Sybase is developing a product known as the Data Navigator, which will support high-speed transaction updates in a partitioned SQL Server database running on tightly coupled servers. Sybase is also expected to introduce the Omni Server, a translation gateway that will support distributed queries on multivendor databases across a network.

Although these offerings are not expected until next year, Sybase has been quietly briefing analysts and key users on its product plans for the past few months.

Sybase declined to comment

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NETLINE

NEWSPAPER

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MCI, CANADIAN carriers cut network deals. Page 62.

SMP DEMONSTRATED for first time at net management symposium. Page 62.

Users find Windows keeps application meter running

By Joanne Cummings
Senior Writer

FOXBORO, Mass. — The way Microsoft Corp. and other vendors license networked applications under Windows has at least one major company questioning the wisdom of deploying the graphical user interface across its enterprise network.

When Windows users are finished with an application accessed from a server, such as Microsoft's Excel spreadsheet, they can either exit it altogether or leave it as a Windows icon. While the user has moved on to something new, the iconified application is technically still in use, according to some vendors.

That's a problem for users with concurrent network licenses supporting a fixed number of active users. As applications are iconified, licenses are soaked up and access is denied to other users.

To avoid that, companies are faced with the expensive prospect of buying concurrent licenses for more users than are really active. A better answer, managers contend, is to revamp shared applications that work under Windows to support an icon time-out, which would close out an application if it sits idle for a specified time.

"For some reason, Microsoft has refused to do this," said John Puckett, manager of engineering and network services at The Fox-

(continued on page 62)

Banyan to tie NetWare up with VINES

By Caryn Gillooly
Senior Editor

NEW YORK — Banyan Systems, Inc. this week will introduce products designed to provide interoperability between two of the industry's leading local-area network operating systems.

At a press conference here, Banyan is expected to release Enterprise Network Services for NetWare, a three-part product that will let users integrate Banyan VINES and Novell, Inc. NetWare environments using VINES' StreetTalk directory service.

According to sources, the

(continued on page 65)

SMDS poised for show of support by major vendors

DEC, Apple and Novell file documents outlining SMDS support, while IBM works on SMDS DSU.

By Bob Wallace
Senior Editor

In a show of support that stands to give Switched Multimegabit Data Service (SMDS) a major boost, vendors including Apple Computer, Inc., Digital Equipment Corp., IBM and Novell, Inc. are taking steps toward providing SMDS support for their respective networking protocols.

This ground swell of support, combined with growing user interest in SMDS, is helping establish the service as a viable alternative to dedicated links for high-speed data communications.

Perhaps the most important upcoming development will be IBM's first announcement of support for SMDS, which analysts agree will be a watershed event in the service's evolution.

IBM is working with another unidentified vendor to develop a data service unit (DSU) that will encapsulate Systems Network Architecture data into SMDS packets, said Allen Millar, multimedia director for IBM's networking systems group in Raleigh, N.C., and a member of the SMDS Interest Group's (SMDSIG) board of directors.

"It could be used with cluster

(continued on page 64)

Informix adds NLM version of its OnLine DBMS offering

Also unwraps database supporting Windows.

By Wayne Eckerson
Senior Editor

MENLO PARK, Calif. — Informix Software, Inc. today will round out its line of database servers by announcing a NetWare Loadable Module (NLM) version of its Informix-OnLine database management system.

In addition, Informix will announce today a new version of its Informix-SE database that supports applications running Microsoft Corp.'s Windows.

Informix-OnLine for NetWare will run under Novell, Inc.'s NetWare Version 3.11 and will support DOS and Windows clients on NetWare networks.

With the introduction of Informix-OnLine for NetWare, the firm now offers customers a low-end database, Informix-SE, that runs on DOS and NetWare, as well as a high-end database, Informix-OnLine, that runs on NetWare and Unix. Database applications developed on one platform can be migrated easily to any other platform supported by Informix, said Susan Nurse, market development manager at Informix here.

"The NLM database fits nicely into our strategy of providing customers with robust, scalable

(continued on page 67)

IBM rollout to include FEP boost and new LAN hubs

By Michael Cooney
Senior Editor

NEW YORK — In a wide-ranging product rollout here Tuesday, IBM is expected to announce new intelligent LAN hubs and products that beef up front-end processor (FEP) performance.

IBM will also address network management with new Advanced Peer-to-Peer Networking design tools, a NetView Performance Monitor upgrade and software that makes it easier to manage distributed networks of Application System/400 minicomputers.

Expected enhancements to the 3745 Communications Controller include new high-performance FEP adapter boards that can off-load some of the box's CPU work load. Included is a new Token-Ring adapter that moves most of the Token-Ring protocol processing off of the 3745's CPU.

The box's recently available Ethernet adapter is an example of what IBM's 3745 off-load technology can do. IBM executives earlier this year said that card is expected to improve the 3745's performance fourfold by off-loading some processing from the FEP ("IBM separates FEP fact from fiction," *NW*, Aug. 3).

(continued on page 65)

Briefs

Octel to acquire Tigon. Octel Communications Corp., the largest voice mail systems provider, last week announced it has signed a definitive agreement to acquire Tigon Corp., the largest voice mail service provider. Terms of the proposed acquisition, to be completed in October subject to regulatory approval, were not disclosed.

Council recommends easing restraints. Last week, Vice-President Dan Quayle's Council on Competitiveness released a report on regulation that recommended loosening the Modified Final Judgment restrictions on the regional Bell holding companies. In the report, "The Legacy of Regulatory Reform: Restoring America's Competitiveness," the council stated that allowing the RBHCs to manufacture equipment would spur competition and benefit consumers. The report also said the Federal Communications Commission should be allowed to assign radio frequency licenses through the competitive bidding process instead of the current method of hearings and lotteries.

AT&T helps travelers get the fax. AT&T last week announced AT&T Fax Mailbox, a new service that will enable users to receive facsimiles while traveling. With the service, any AT&T calling card holder can get a mailbox number to which faxes or 45-second voice messages can be sent and stored for up to eight days. Mailbox owners access their messages and faxes via an 800 number from any push-button phone or fax machine and pay 70 cents per fax page and 35 cents per voice memo. All charges are billed to the AT&T card.

Cisco makes a quick fix. Following user complaints, Cisco Systems, Inc. this week will begin shipping a software patch to fix a problem with token-ring interfaces on its Multibus mid-range routers, according to a company spokesman, who said the problem is isolated.

OSPF group to meet. The Open Shortest Path First (OSPF) Interoperability Technical Working Group will meet later this month at 3Com Corp.'s headquarters in Santa Clara, Calif., to discuss the adoption of bylaws and coordination of interoperability testing procedures. The group, which comprises vendors, users and testing laboratories and is open to new members, was formed to foster interoperability among vendors' implementations of the OSPF routing protocol. For more information, call Jim Hourihan at (617) 280-2107.

DEC's TeamLinks to ship — finally. Digital Equipment Corp. this week will announce that its TeamLinks groupware application suite is shipping — six months late. Unveiled in November 1991, TeamLinks was codeveloped by DEC and Microsoft Corp. to let Microsoft Windows desktop machines work with DEC servers supporting such applications as electronic mail and conferencing, document management and file browsing. Rigorous beta testing, complicated integration with DEC's older All-In-1 office suite and internal turmoil at DEC caused the delay, according to DEC and other sources.

OSIware delivers fax gateway. OSIware, Inc. last week brought out an X.400-to-facsimile gateway product. The Messenger 400 Fax Access Unit (FAU) is a personal computer-based product housing up to four fax boards, an X.25 card and Transmission Control Protocol/Internet Protocol software. It allows any X.400 messaging system to route messages to the FAU for conversion and delivery as Group III facsimiles. Messenger 400 FAU is available now for $10,000.

CONTACTS

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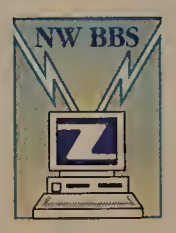

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OSI spec to spur product development

By Ellen Messmer
Washington Correspondent

GAITHERSBURG, Md. — Representatives from government, and the manufacturing and utility industries will meet here next week to assemble the draft of a technical specification intended to build a broad market for OSI products.

The Industry and Government Open Systems Specification (IGOSS) will be endorsed by the Electric Power Research Institute (EPRI), the MAP/TOP Users Group and the National Institute of Standards and Technology (NIST), presenting a united front for Open Systems Interconnection from three factions: the power companies, manufacturing and the federal government.

Wade Malcolm, program manager for power electronics and controls at EPRI, said IGOSS is needed to eliminate differences between documents such as EPRI's Utility Communications Architecture (UCA) and NIST's Government OSI Profile (GOSIP). Such differences present a divided OSI market to vendors.

"One of the things we ran into is that [the MAP/TOP Users Group's], UCA's and NIST's GOSIP are updated at different points," Malcolm said. "We weren't doing much to create a unified market for OSI."

But the three groups, which have planned IGOSS for more than a year, will meet next week to put together the draft version of the specification. That version will be issued for public comment before it gets final approval, which could be as early as June.

Jerry Mulvenna, manager of the network architecture group at NIST, said IGOSS is intended as the third version of GOSIP for the federal government. IGOSS will include a range of OSI protocols, such as Transaction Processing, Remote Database Access and the 1988 version of X.400, items that were not part of the earlier GOSIP versions (see chart, this page).

The purchasing requirements for GOSIP Version 3 will not be mandated until sometime in 1995, Mulvenna said. "We want to be conservative about product availability," he added.

Gary Workman, a member of

(continued on page 66)

Recipe for interoperability:

The ingredients that will go into the Industry and Government Open Systems Specification

- ❑ Frame relay
- ❑ FDDI
- ❑ 1988 X.400
- ❑ X.500 Directory Services
- ❑ Remote database access
- ❑ Transaction processing
- ❑ Manufacturing Message Specification
- ❑ The X Window System over OSI
- ❑ Information retrieval
- ❑ Intermediate System to Intermediate System

SOURCE: NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY, GAITHERSBURG, MD.

Small router has high-end capabilities

By Skip MacAskill
Staff Writer

MENLO PARK, Calif. — Cisco Systems, Inc. last week unveiled a mid-range, modular router designed for work groups in regional or branch offices that use both Ethernets and token rings.

The new Cisco 4000, which can support Ethernet, token ring or a combination of the two, offers users high-end functionality at low-end prices, said David Gudmundson, product marketing manager at Cisco.

"The Cisco 4000 offers a cost-effective solution with the modularity and flexibility you normally only get in high-end products," he said. "We've migrated high-end features to the regional and branch office levels, including mixed Ethernet-token ring functionality and backup serial-line capabilities."

The three-slot Cisco 4000 chassis allows the net manager to plug a mix of Ethernet, token-ring or wide-area serial interface modules directly into a motherboard, which is mounted on a slide-out tray to ease the process of adding or changing modules when needed.

The device is based on a 40-MHz MC68030 processor, with 4M bytes of dynamic random-access memory that is expandable to 16M bytes.

The use of flash erasable programmable read-only memory allows the router software to be remotely upgraded. Front- and rear-panel LEDs indicate power supply status and network activity for each module.

The single-port token-ring module can be configured for either 4M or 16M bit/sec and is powered by a Texas Instruments, Inc. TMS380C16 CommProcessor chipset and Madge Networks, Inc. driver code.

The single-port Ethernet module can be configured with either an attachment unit interface port or a 10Base-T unshielded twisted-pair wire port. It is driven by an Advanced Micro Devices, Inc. 7990 Lance chip.

The serial module has two ports that support V.35, X.21, RS-232 and RS-449 interfaces at rates up to 4M bit/sec. Users may configure one serial port as a backup to the other in case of failure.

Variety of configurations

The Cisco 4000 can support a wide variety of configurations,

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NCR looking to bolster LAN and net mgmt. offerings

Upgrades of StarGroup, StarSentry expected.

By Jim Duffy
Senior Editor

LINCROFT, N.J. — NCR Corp. is readying a new release of its StarGroup LAN Manager net operating system for the fourth quarter that features improved network administration and the ability for local-area net clients to access multiple protocol stacks on the server.

Separately, NCR said it will add a number of new features to its StarSentry network management system, including the ability to distribute software to non-NCR devices.

The upgraded StarGroup LAN Manager 2.1 — NCR's version of Microsoft Corp.'s LAN Manager network operating system for Unix servers — will give users an added level of network security and enhanced interoperability between clients, servers and host computers, according to NCR.

For network administration and security, StarGroup LAN Manager 2.1 will support a Microsoft Windows interface, instead of the older DOS or OS/2 menus,

(continued on page 66)

New version of cc:Mail adds Unix client support

By Wayne Eckerson
Senior Editor

MOUNTAIN VIEW, Calif. — Lotus Development Corp. today will announce a version of its cc:Mail LAN-based electronic mail system for Unix clients.

The new version, cc:Mail for Unix, will run on Sun Microsystem, Inc. SPARCstations and support Sun's OpenLook graphical user interface. The software bolsters the cc:Mail product family, which currently supports DOS, Windows, OS/2 and Macintosh clients.

Users of the new version will be able to exchange messages with cc:Mail users on any supported platform, as well as with users on other messaging systems via cc:Mail and third-party gateways.

The new version will support all the features in other cc:Mail messaging software. These include context-sensitive menus and help screens, location-independent addressing, and support of compound documents, audio messages and application integration.

In addition, the new messaging software will offer built-in support for the Simple Mail Transfer Protocol, giving users the ability to exchange messages with users on Transmission Control Protocol/Internet Protocol networks, such as the Internet. The software complies with the Internet Architecture Board's Request for Comment 821 and 822 standards, which specify how E-mail will be transported across TCP/IP networks.

The software will support the X Window System protocol, enabling users to run cc:Mail on X clients and X servers, according to Atta Rasekhi, Unix product manager for cc:Mail here.

The new version costs $895, and licenses range in price from $345 for a 10-seat license to $3,295 for a 100-seat license.

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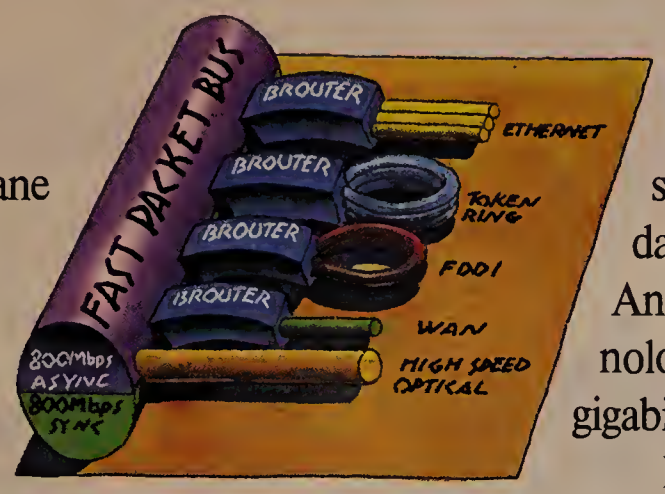
hubs. Instead, the Enterprise Hub's segmented backplane lets you integrate and internetwork multiple Ethernet, Token Ring and FDDI LANs all within the same hub.



The Enterprise Hub's segmented backplane architecture allows incremental expansion of your network to utilize over 2 Gbps of bandwidth.

When you want to move users around the network, there's no need to navigate your way through various wiring closets. Thanks to the Enterprise Hub, reconfiguration is easily handled from your network management station.

STEER CLEAR OF TRAFFIC.

Segmented hubs have become the network's highway system. So integrating bridges and routers within the hub makes perfect sense. However, that can result in the type of backplane traffic that resembles rush hour in L.A.

The Enterprise Hub provides an express lane to speed traffic through. Its high speed bus architecture offers 1.6 Gbps of throughput. Because the bus is cell-based, it supports high speed hardware switching in both asynchronous and synchronous datastreams. And when technologies like gigabit hub-to-hub links and ATM interfaces are ready, your hub's ready for them.

MORE INTELLIGENT MANAGEMENT.

There's nothing too smart about expanding your network to the point where it grows beyond your control. Here again, the Enterprise Hub is the intelligent choice.

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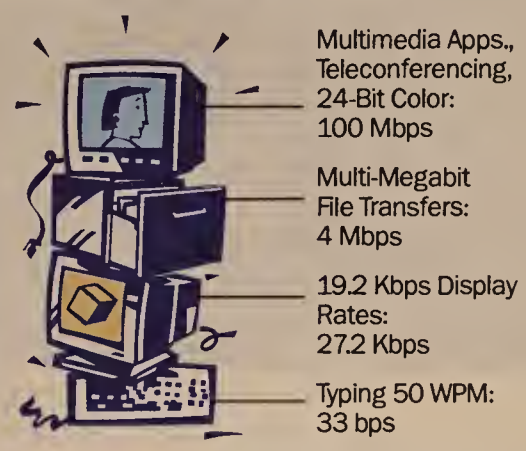
REDUNDANT. REDUNDANT. REDUNDANT.

Network managers tell us they need absolute system reliability. You'll get no argument from Hughes. Instead what you'll get are system safeguards like redundant load-sharing power supplies. Hot-swappable modules. Redundant hub-to-hub links. So while network users enjoy great performance, network managers enjoy great peace of mind.

THE BIG PICTURE.

Even if you're focused on your company's current needs, experience has taught you enterprise networking needs are unpredictable. So the hardware investments you make today should pay dividends for many years.



In the future, as complex applications demand greater bandwidth, the Enterprise Hub gives network managers the flexible architecture they need to make migration simple.

It's time to think big. Look at the Enterprise Hub's 2 Gbps bandwidth versus your typical hub's 10 or 20 Mbps. You'll find a huge difference in terms of performance. But in terms of price, you'll find the difference little to none. Call **1-800-395-5267** for more information about the Enterprise Hub and Hughes LAN Systems' big picture networking solutions.

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THE PAINLESS PILGRIMAGE FROM ANALOG TO DIGITAL

Model	Type	Max. Rate	Network	Features
SW56II	Accunet Sw. Digital	56 Kbps	4-wire Sw. Digital	Keypad, Autodialer
DU100	Datapath Sw. Digital	64 Kbps	2-wire Sw. Digital	All Rates
DU170	Datapath Sw. Digital	64 Kbps	2-wire Sw. Digital	Keypad, Autodialer
TA120	Terminal Adapter	2 Ch. @ 64K 1 Ch. @ 16K	ISDN	Supports Voice & Data
TA/DL	Terminal Adapter	1 Ch. @ 64K 1 Ch. @ 16K	ISDN	X.25 PAD, Soft Upgrade
TA220	Terminal Adapter	2 Ch. @ 64K 1 Ch. @ 16K	ISDN	Combines "B" Channels
D56	DSU/CSU	56 Kbps	DDS	Low Cost 56K Sync.
DDS/MR1	DSU/CSU	56 Kbps	DDS	All DDS Rates
DDS/MR2	DSU/CSU	56 Kbps	DDS	DDS with Sec. Channel
DDS/V.32	DSU with V.32 Modem	56 Kbps	DDS/ Analog	Auto-dial Backup
T1-ESF-CSU	CSU	1.544 Mbps	T1	ESF & D4 Framing

Sooner or later, you've got to make the move from analog to digital for your data communications. And contemplating the trip is a little spooky.

Here's the way to make the pilgrimage both painless and profitable.

Just stick with UDS.

Years of industry leadership in high-speed modems have taught UDS the ins and outs of the telephone system—both leased line and dial-up. That knowledge has now been transferred to the developing world of the digital telephone network. At UDS, more than a dozen digital devices—DSU/CSUs, (DDS, T1, fractional T1, T1-ESF) switched 56 and ISDN terminal adapters and termination devices—are already being shipped. They are appropriate for a wide variety of applications—present and future.

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John Kiernan
Vice-president
Time/LAN program
Ascom Timeplex, Inc.

Data Packets

Micom Communications Corp. of Simi Valley, Calif., next week will announce new Ethernet bridging functions for its Marathon 1K and 5K Data/Voice Network Server multiplexers.

The new remote LAN bridge (RLB) option includes an Ethernet card that plugs into the 1K and 5K muxes, allowing them to attach directly to a local-area network. The box can then combine LAN traffic with other voice, data and facsimile traffic over a single 9.6K to 64K bit/sec line.

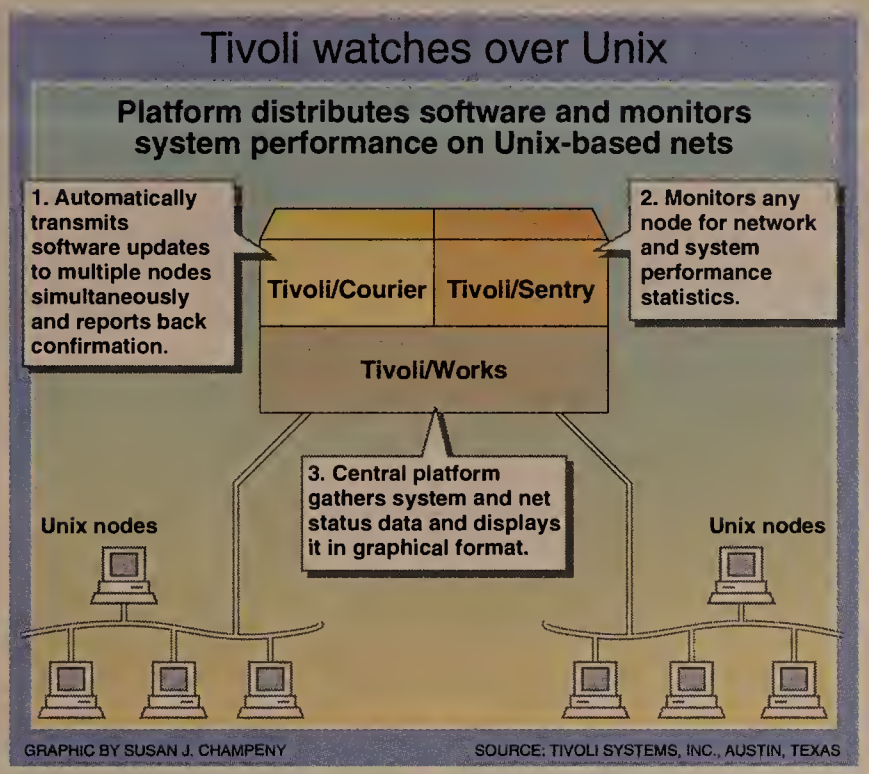
The new RLB option is available for $1,750. The Marathon 1K base model is priced at $1,750, while the Marathon 5K starts at $2,750.

Tekelec, Inc. of Calabasas, Calif., brought out an enhanced wide-area network protocol analyzer, dubbed the Chameleon 32-plus, that features a faster CPU and an additional 3M bytes of memory. It replaces the Chameleon 32.

The Chameleon 32-plus also features an improved floppy disk drive and VGA monitor, as well as automatic alarm notification.

The Chameleon 32-plus ranges in price from $19,995 to $24,995. It is available now.

Tekelec can be reached at (818) 880-5656.



Tivoli bolsters net mgmt. platform, intros new apps

Zeros in on software distribution, net monitoring.

By Michael Cooney
Senior Editor

AUSTIN, Texas — Tivoli Systems, Inc. last week announced new systems management applications that will let Unix users distribute software upgrades and more effectively monitor network resources.

The firm also announced Release 1.5 of its management platform, Tivoli/Works, which now supports the Open Software Foundation, Inc.'s Motif graphical user interface and can receive more detailed management messages, such as the system configuration and location of downstream Unix devices.

> Prior to Courier, updates could be done but only one node at a time.
>
> ▲▲▲

Works is a collection of applications previously known as the Primary Resource Manager and Privilege Security Manager.

The core Works software resides on a Sun Microsystems, Inc. SPARCstation running the Solaris operating system, while a client portion runs on each workstation being monitored. When the manager's system is turned on, the Works platform automatically identifies all attached system resources and reports them as objects to the Works object-oriented database.

For software distribution, Tivoli announced the Tivoli/Courier application, which runs on the Works platform and can automatically distribute software updates or files to multiple Works nodes simultaneously. Prior to Courier, software updates could be done from the manager's platform but only one node at a time.

Also being introduced is the Tivoli/Sentry application for monitoring system and network performance. Sentry is software that resides on each node in the Unix net and at the manager's station.

Using Sentry, net managers can gather data such as hard-disk memory levels on any networked node. Net and system error messages are passed to the central Works station and displayed on a color graphical screen. Users can take action manually or write applications that automatically respond to alerts.

In addition, Tivoli introduced a developers' tool kit for users who want to create their own management applications. The Tivoli/Advanced Development Environment (ADE) lets users write object-oriented management applications that can plug into the Works platform.

(continued on page 19)

DEC, Systems Center unveil fruits of labor

Two years in making, pack allows mgmt. of mixed net environments from three platforms.

By Jim Duffy
Senior Editor

MAYNARD, Mass. — After two years of development, Digital Equipment Corp. and Systems Center, Inc. last week unwrapped software designed to let users manage mixed IBM and DEC environments from any one of three management systems.

DEC also moved to bolster its Unix and VAX systems management offerings by rolling out additions and enhancements to its Polycenter portfolio of systems and network management products and services. The new products include applications that compile configuration data and automate problem detection.

For managing mixed networking environments, DEC and Systems Center — as expected — unveiled Polycenter SNA Manager 1.0 and Solve:Connect for EMA.

Combined, the products support information exchange between the DEC and IBM environments, allowing users to monitor and control Systems Network Architecture, DECnet Phase IV, Transmission Control Protocol/Internet Protocol and DECnet Open Systems Interconnection nets from a DEC Management Control Center (DECmcc) Director, Systems Center Net/Master or IBM NetView console ("DEC, Systems Center plan management link," *NW,* June 22).

Polycenter SNA Manager resides with DECmcc Director on a DEC VAX in a DECnet or TCP/IP environment. It includes an SNA Access Module, which defines the SNA environment for DECmcc Director, and a Presentation Module, to initiate SNA management commands through a command line or graphical user interface on a DECmcc Director console.

On the SNA side, Systems Cen-

(continued on page 19)

HP introduces upgraded OpenView for Windows

By Jim Duffy
Senior Editor

PALO ALTO, Calif. — Hewlett-Packard Co. recently brought out a new version of its OpenView for Windows network and systems management software that features automatic node mapping and easier installation.

OpenView for Windows is a Simple Network Management Protocol-based management system that allows users to monitor events and collect alarms from clients, printers and servers on a Transmission Control Protocol/Internet Protocol network. It includes software tools that help users develop their own management applications and a network topology map that runs on Microsoft Corp. Windows workstations.

OpenView for Windows 6.0, which is currently shipping, includes a so-called dynamic map update feature. This capability allows OpenView to automatically update its network map when a new node is added to the net.

Another new feature is automated installation of OpenView on a Windows workstation. Users can now install OpenView by executing a command from their Windows screen.

Meanwhile, HP said it will ship OpenView for Windows 7.0 in the first quarter of 1993.

That version will automatically discover new nodes on the network and add them to the map, automatically run programs that take corrective action in response to certain alarms, and quickly scan management information base data on a particular device to set management variables.

The OpenView for Windows 6.0 developers' kit is priced at $2,500. The runtime version, which includes mapping and alarm management, is priced at $350. Both products are available now.

Network printing.

When it comes to network printing, you want to move swiftly. Give the job to the LaserJet IIISi printer from Hewlett-Packard.

The LaserJet IIISi printer has a 17 page-per-minute engine and a RISC-based formatter for fast text and graphics. It's also network-ready. When you add an HP JetDirect card, the printer is seen as a node on the network. That means you can place it anywhere along the network. Anywhere your users need easy access to their output. You're no longer limited by a faraway server.

The LaserJet IIISi avoids bottlenecks by pulling data through the interface card 30 times faster than the standard parallel rate. It is therefore able to print 18 times faster than ordinary printers. And, since your file server is relieved of some print server functions, you'll enjoy faster transaction times and increased speed across your entire system.

Network printing with the LaserJet IIISi.

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3Com 3+Open	*802.3* *Token Ring (4/16 Mbps)*
Microsoft® LAN Manager	*802.3* *Token Ring (4/16 Mbps)*
IBM LAN Server	*Token Ring (4/16 Mbps)*
AppleTalk	*LocalTalk* *EtherTalk*
*HP-UX***	*Ethernet/802.3*
*SunOS***	*Ethernet/802.3*
SCO UNIX	*Ethernet/802.3*

The fastest printer in the LaserJet family also speeds up the process for network managers. You can now troubleshoot the entire printing network and track data transfer from network to printer. You'll finally be able to take full advantage of your network management software.

For just $5,495,* the LaserJet IIISi wins the race. For more information, and the name of your nearest authorized HP dealer, call 1-800-LASERJET, Ext. 7096.†

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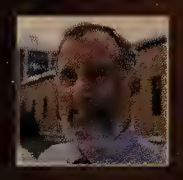

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Deborah Brock
Manager, PC and Network Services
Raymond James & Associates

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Bruce M. Weller
Director
Computing Services
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Worth Noting

"Print services have been on the back burner for too long. The time has come for print services to be recognized as a peer to other network services."

Craig Burton
Chief executive officer
and principal analyst
The Burton Group
A Salt Lake City-based
research and consulting firm

Netnotes

A new family of network protocol analyzers from **Dolphin Networks** will make its debut at NetWorld 92 Dallas next month. Designed to be affordable, the Dolphin Expert System Protocol (ESP) analyzers will come in kits containing a network interface card — either Arcnet, Ethernet or token ring — and DOS-based software that can turn any Industry Standard Architecture-bus personal computer into a network analyzer with expert help.

The Dolphin ESP family will capture and filter packets, display real-time traffic statistics and alarm managers to network events and errors. It will also offer an expert help system that, in response to common error messages, offers possible diagnoses or suggestions for further testing.

The devices will support the Internetwork Packet Exchange/Sequenced Packet Exchange (IPX/SPX), the Transmission Control Protocol/Internet Protocol, AppleTalk, StreetTalk, Open Systems Interconnection, Server Message Block, Xerox Network Systems and Network Basic I/O System.

Other protocols are available separately. The Arcnet, Ethernet and token-ring versions will cost $995, $1,495 and $1,995, respectively.

NetFRAME adds low-end superserver model to line

Offers high-end fault tolerance at low-end price.

By Caryn Gillooly
Senior Editor

MILPITAS, Calif. — NetFRAME Systems, Inc. last week added to its line of superservers a low-end model it says is designed specifically for smaller networks running mission-critical applications.

Dubbed the NF200ES, the new machine can support as many as three networks and has more fault tolerance and better performance than the existing low-end NF100ES machine.

Like the existing NF100ES, the 200 model is a multiprocessor, multiple bus superserver that can support as many as three networks. NetFRAME's higher end machines, such as the NF450FT, can support eight nets.

Unlike the 386-based NF100ES, however, the NF200ES has a 486DX system processor. In addition, the new system can be configured with one to three Intel Corp. 80386-based I/O processors that off-load the majority of I/O tasks from the system processor, leaving it to handle application processing.

The NF200ES can support up to five processors — two system processors and three I/O processors — while the earlier version supported a maximum of three.

Also differentiating it from the NF100ES, is a hot-swappable disk subsystem, a high-end feature that makes it more appropriate for mission-critical applications.

"We've brought the [hot-swappable drive] feature down to the entry level, whereas before it was only available on the higher end machines," said Eric Johnson, manager of hardware marketing at NetFRAME. "This way, if you're running an inventory application that can't go down, for example, you can change disks and keep the system up."

Users seemed to appreciate the high-performance/low-price

(continued on page 18)

Xircom bundles its peer LAN with NetWare Lite 1.1

By Margie Wylie
Senior Editor

CALABASAS, Calif. — Xircom, Inc. is now shipping its peer-to-peer network bundled with Novell, Inc.'s new NetWare Lite Version 1.1.

Xircom's Network Simplicity Pack 1.2 includes everything need to set up a two-node, one-printer NetWare Lite 1.1 peer-to-peer Ethernet net for a new low price of $499, down from $849. Additional nodes cost $229; additional printers cost $95.

The new version of the pack ships with the recently upgraded NetWare Lite, which can now run on the same personal computer as Microsoft Corp.'s Windows 3.1 and features disk-caching and extended memory support for some executables, offering better overall performance.

Other components of the pack include two Xircom Pocket Ethernet Adapters, one Parallel Port Multiplexor and two copies of Xircom's own software, which adds electronic mail, and automatic installation and setup to Novell's peer-to-peer networking software. Thin coaxial cabling and terminators sufficient for a two-node net also ship with the package.

Pocket Ethernet Adapter connects to the network via one thin Ethernet connection and attaches externally to any PC via a parallel port. The external adapter also allows PCs that may not have internal slots, such as portables, to become part of the network. Xircom's Parallel Port Multiplexor splits a PC's parallel port, allowing it to connect to the network and a printer simultaneously.

Simplicity SetUp software lets users follow menus to name workstations and identify what disk space and printers should be shared with other users.

Simplicity E-Mail lets users send and receive pop-up E-mail messages from within any program using a hot key.

NetWare Lite 1.1 is available as a free upgrade to current Network Simplicity customers.

Madge's new Straight Blue token-ring adapter line

Product (all shipping Oct. 15)	Unshielded twisted-pair support	Shielded twisted-pair support	16-bit support	Price
Straight Blue 16/4 MC Adapter	Yes	Yes	Yes	$545
Straight Blue 16/4 ISA Plus Adapter	Yes	Yes	Yes	$545
Straight Blue 16/4 ISA Adapter	No	Yes	No	$445

GRAPHIC BY SUSAN J. CHAMPENY — SOURCE: MADGE NETWORKS, INC., SAN JOSE, CALIF.

Madge takes on IBM with token-ring cards

Rolls out new adapters that use IBM chipset but cost far less than comparable Big Blue offering.

By Caryn Gillooly
Senior Editor

SAN JOSE, Calif. — In an effort to challenge IBM's stronghold in the token-ring market, Madge Networks, Inc. this week is expected to bring out a new line of token-ring adapter cards at lower prices and with additional service and support.

The new Straight Blue family of cards will be geared toward general workstation use on a local-area network. It will consist of two Industry Standard Architecture (ISA) and one Micro Channel Architecture (MCA) card, all of which will include IBM's own Token-Ring chipset.

According to Chris Carter, marketing manager at Madge Networks, based here, the new product family is aimed directly at current IBM customers. With the IBM chipset, he said, customers will now be able to get the same functionality offered by the IBM cards but with added value through extra media support and extra service — all at a lower cost than IBM's offering.

"Now the market is clearly pure IBM, with everybody else fighting for market share," said Charles Robbins, an analyst at the Aberdeen Group, Inc., a Boston consultancy. "But if you take the same technology and offer it at just over half the price, people are going to turn their heads."

The new cards are the Straight Blue 16/4 MC Adapter, the Straight Blue 16/4 ISA Plus Adapter and the Straight Blue 16/4 ISA Adapter. The first two are 16-bit adapters, while the latter supports 8-bit operation.

All three support both 4M and 16M bit/sec token-ring transmission over shielded twisted-pair cabling, although the MCA and ISA Plus cards also support transmission over unshielded twisted pair (see graphic, this page). According to Carter, the IBM Token-Ring cards that are comparable to the MCA and ISA Plus cards support only shielded twisted pair.

The firm will list the cards at $445 for the ISA Adapter and $545 each for the ISA Plus and MCA adapters. IBM's comparable offering costs $895. Madge Networks is also offering a five-year warranty on its cards, whereas IBM offers a one-year warranty.

The Straight Blue line is for lower ends than Madge Networks' existing Smart Ringnode line of token-ring adapter cards.

In conjunction with the new cards, Madge Networks this week is expected to announce a new service division, Madge TeleDirect. Through the division, all token-ring users — even those that do not use Madge Networks products — can receive general token-ring LAN support information through MadgeFax, a free program where customers call to ask questions and representatives fax responses to them.

For current and prospective Madge Networks users, the company will also offer free hot line technical support and a money-back satisfaction guarantee for its Straight Blue and Smart Ringnode lines.

The new cards will be available Oct. 15, the same date the TeleDirect division will begin operation. On or after that date, customers can call (800) 876-2343 for the free services.

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†This service is provided by contracted Service Providers and may not be available in certain geographic locations. Contact the Compaq Customer Support Center for further details. *Suggested retail price; reseller price will vary; monitor not included; price indicated is for COMPAQ ProLinea 3/25zs Model 40, not pictured here. © 1992 Compaq Computer Corporation.

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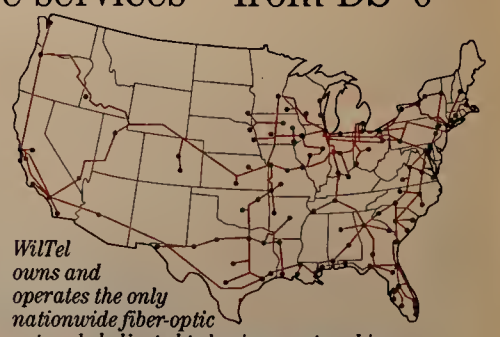

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Worth Noting

According to a recent report from Gartner Group, Inc., Asynchronous Transfer Mode (ATM) interfaces for existing hubs will appear within 24 months, hubs with an ATM switching fabric will be available within 36 months and ATM to the desktop will be widely deployed in five to seven years.

Link Notes

Chipcom Corp. last week unveiled a new controller module and 10Base-T transceiver for its ONline System Concentrator family of intelligent switching hubs.

The ONline Fault-Tolerant Controller Module supports clocking for all ONline Ethernet, token-ring, Fiber Distributed Data Interface, router, terminal server and management modules.

For redundancy, one controller module can be configured as an active module and a second one as a redundant module.

The ONline Fault-Tolerant 10Base-T Transceiver, which supports both shielded and unshielded twisted-pair links, comes equipped with one attachment unit interface port and two RJ-45 ports.

The transceiver can be used to connect a personal computer, workstation or repeater to a hub, with one RJ-45 port acting as a backup to the other in case of failure.

The controller module and transceiver are both available now and are priced at $1,500 and $495, respectively. For more information, contact Chipcom at (508) 450-8900.

NEC's low-cost LAN server serves in many capacities

New device costs about half the price of routers.

By Joanne Cummings
Senior Writer

SAN JOSE, Calif. — NEC America, Inc.'s Data and Video Communication Systems Division this week will unveil a LAN communications server that combines the functionality of a router, modem, terminal server and hub at a low cost.

The unit, called Dr. Bandwidth-on-Demand (BonD), can be configured to establish dial-up links to remote sites and route traffic at the least expensive time of day or prioritize traffic according to destination. It can also serve as a dial-up backup unit for leased-line routers or handle traffic overflow in frame relay networks.

According to analysts, the device is about half the price of router-only products from companies such as Cisco Systems, Inc. and Wellfleet Communications, Inc., although the new box's performance has yet to be compared to that of high-end products.

"Remote users are looking for base functionality at a low price," said Charles Robbins, director of communications research at Aberdeen Group, Inc., a Boston consultancy. "This product delivers a lot of functionality at an attractive price. [NEC] is not a major player in this market, but they've jumped ahead of what I've seen."

Dr. BonD is designed for Ethernet local-area networks running the Transmission Control Protocol/Internet Protocol or Novell, Inc.'s NetWare. It can route TCP/IP, Unix and Internetwork Packet Exchange (IPX) protocols over dial-up links by using the unit's routing table to associate IP addresses with phone numbers, the company said.

The device can be managed by any Simple Network Management Protocol-based management station.

Dr. BonD comes in three mod-

(continued on page 18)

CrossComm enhances mgmt. pack

By Skip MacAskill
Staff Writer

MARLBOROUGH, Mass. — CrossComm Corp. last week unveiled a new release of its net management system that controls IBM source routing bridges and Token-Ring adapter cards.

According to CrossComm, the added support in Version 5.1 of the Internetworking Management System (IMS) makes it the first management platform to let users manage IBM bridges and Token-Ring cards as well as non-IBM devices.

IMS 5.1, which supports the Simple Network Management Protocol and runs on a central management console, provides a graphical user interface and a topology map under Windows 3.X that allow users to manage IBM source routing bridges via IBM's LAN Network Manager protocol.

Although other SNMP management systems offer a topology map feature, none can display IBM source routing bridges because those devices do not support SNMP, CrossComm said.

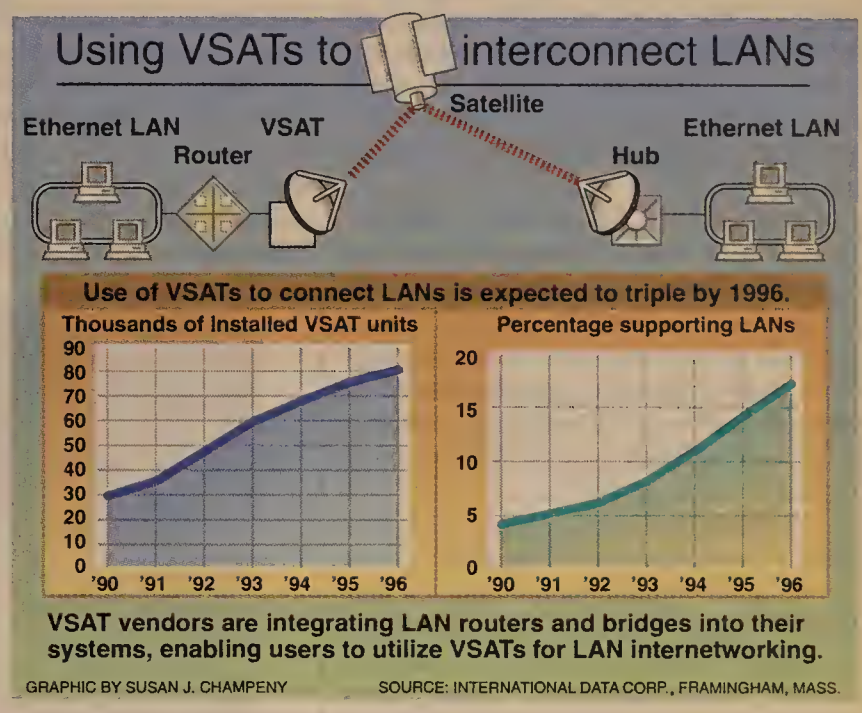
The company achieves this by including a LAN Network Manager protocol stack in the upgraded IMS software that allows users to define the source routing bridges and talk to them via LAN Network Manager.

Through the use of the topology map, information such as net statistics, error messages and net configuration can be accessed by clicking on the device icon.

Because IMS 5.1 can also be used to manage Token-Ring cards, network managers can access information from IBM Token-Ring local-area networks, including media access control addresses, LAN segment numbers and error statistics.

If an adapter card fails, the net manager can isolate it from the network with a simple command. This capability is significant for companies with small, remote offices because it enables troubleshooting of remote Token-Ring LANs from a central location.

IMS 5.1 is available now and costs $4,995. Current IMS 5.0 users can upgrade to the new version for $695.



VSATs poised for new internet role

While land lines dominate today for LAN links, IDC study predicts dramatic growth in VSAT use.

By Joanne Cummings
Senior Writer

FRAMINGHAM, Mass. — Born in the early '80s when terminal-to-host nets were the norm, very small aperture terminal networks are finding it difficult to adapt to today's local-area network interconnection environments.

Due to several factors, including cost and transmission speed limitations, VSATs are far from becoming users' LAN interconnection method of choice.

But according to a recent report from International Data Corp. (IDC), a research firm here, linking LANs via VSATs makes sense if the satellite network is already in place.

The report predicted that LAN interconnections within the installed base of VSATs are expected to rise dramatically. While today just 6% of the VSATs installed are used to link LANs, that number is expected to almost triple, reaching 17% by 1996.

VSATs tend to be more cost-effective than T-1 lines for organizations with a large number of geographically dispersed sites. "When a customer has a large number of sites and only moderate bandwidth requirements, VSATs offer a cost advantage over land-based links," said Michael Brown, product manager at AT&T Tridom, an Atlanta VSAT maker.

But VSAT-based LAN-to-LAN links add complexity because they not only require a gateway or router for the LAN/WAN protocol translation, as do land-based links, but they also need a central-site hub to route traffic to the destination sites.

According to Gigi Wang, vice-president of communications at IDC, the market for VSAT-type LAN interconnections is fairly small. "The majority of LAN interconnection is done with land lines," she said. "But that is changing because existing VSAT customers are moving to peer-to-peer LAN environments."

Wang said VSAT users are also moving to LAN links because vendors are offering true LAN-enabled systems such as bridge and router cards that can be integrated directly into a VSAT terminal.

Before the advent of integrated systems, VSAT users could interconnect their LANs only through external gateways, routers or bridges that cost between $5,000 and $16,000 to implement. Today, vendors such as Hughes LAN Systems, Inc. and AT&T Tridom are offering integrated solutions priced between $2,000 and $3,000, which makes them much easier to cost-justify.

"Eighty percent of our customers are IBM-based, so we are interested in providing a token-ring solution," Brown said, declining to provide a time frame.

Another factor limiting VSAT as a LAN internetwork technol-

(continued on page 18)

VSATs poised for new internet role

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ogy is its transmission speed. According to the report, products from Hughes, the market leader, can receive data at between 128K and 512K bit/sec and can transmit at between 64K and 128K bit/sec. This is a great deal slower than Ethernet's 10M bit/sec and token-ring's 16M bit/sec transmission speeds.

But current VSAT customers are willing to accept the delay. Burlington Coat Factory Warehouse Corp., a retailer based in Burlington, N.J., has been using VSATs for about five years and has recently moved from a terminal-to-host environment to one of a distributed Ethernet LAN. And it is preparing to implement AT&T Tridom's Ethernet router product.

"We have 180 sites with small bandwidth requirements, and it makes a whole lot of sense to use VSAT," said Michael Prince, director of information systems at Burlington Coat Factory's Lebanon, N.H., offices. "When you figure T-1s might run you $250 a month each, I just couldn't afford that."

He added that the majority of Burlington Coat Factory's traffic flows from Ethernet LANs at the various store sites to a central LAN at its main headquarters in Burlington.

"For what we're doing, VSATs provide the best environment," Prince said. "T-1 can't match Ethernet's [speed], either. But we can get credit card verification in seconds and can send a day's worth of transactions to the central site in about a minute. If I could do that with T-1s for the same price, I would. But T-1s cost about five times what I'm paying."

LAN server serves in many capacities

continued from page 17

els — the S, ST and B.

Model S has one 10Base-T Ethernet interface and four RS-232 serial interfaces, each of which supports speeds up to 115K bit/sec. It also has a line printer port and will support three optional interface cards.

Dr. BonD-ST includes all the features of Dr. BonD-S, plus it supports a 12-port 10Base-T hub card. It also supports two optional interfaces.

Dr. BonD-B offers the same features as the S version but has six option slots that can be configured to support three additional Ethernet LANs or as many as 36 10Base-T hub ports.

According to Jonathan Edney, director of NEC's Transmission Development Division, administrators can configure the device using the menu utility to limit the number of calls placed to a site or to prioritize calls via capacity units or tariff units.

Tariff units assign a waiting period for certain traffic, enabling users to dial up links to more critical sites, such as headquarters, before links to other sites, such as regional offices. Users can also configure Dr. BonD to send traffic only at certain times of the day when carrier rates are least expensive, Edney said.

Dr. BonD can be used as a backup for leased-line routers because if a leased line fails, it can be configured to automatically dial up the disconnected site. It can then route traffic until the line is back up.

The unit can also route overflow traffic from a frame relay network. "Users can avoid paying extra charges for exceeding the frame relay [committed information rates] by configuring Dr. BonD to automatically dial up a site and off-load that extra traffic," Edney said.

Dr. BonD will be available in January. Dr. BonD-S costs from $2,395 to $4,995, depending on configuration. Dr. BonD-ST ranges from $3,500 to $4,995, and Dr. BonD-B costs from $2,495 to $6,995.

NetFRAME adds new model to line

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combination of the NF200ES.

"We purchased an entry-level NetFRAME to run a mission-critical human resources application," said Cathy Daley, information systems manager at Transamerica Commercial Finance.

"Even though there are only 20 people who use this application, we bought a NetFRAME because of its data integrity and high reliability for less than the price of a PC server," she said.

In its entry configuration, the dual-I/O bus NF200ES includes a 25-MHz 486DX system processor, a 386-based I/O processor, 8M bytes of error correction code (ECC) memory and 200M bytes of disk storage.

In its maximum configuration, the system can support up to five processors, including a 50-MHz 486DX system processor, 33G bytes of disk storage and 128M bytes of ECC memory.

The new system is available now for $14,950.

DEC, Systems Center unveil fruits of labor

continued from page 9

ter's Solve:Connect for EMA software resides on an IBM MVS host along with NetView or Net/Master. It is responsible for receipt of alerts and alarms from DECnet and TCP/IP devices in the DEC environment, including devices configured with Simple Network Management Protocol agents. The product also lets NetView and Net/Master users issue corrective instructions to devices controlled by the DECmcc Director host.

Polycenter SNA Manager 1.0 is priced at $15,314. Solve:Connect for EMA is priced from $20,000 to $70,000, depending on the IBM processor. The products will ship in November.

Other new DEC applications include Polycenter System Census 1.0, a package that allows users to compile configuration data on DEC VAX or Ultrix systems located anywhere on a DECnet network and present it on a central console. The product consists of three software elements — Agent, Consolidator and a GUI.

The Agent resides on each DEC VAX and Ultrix system in the network and is responsible for gathering configuration data requested by DECmcc Director or System Census Consolidator.

The Consolidator resides on a VAX or Ultrix system and collects configuration data from the Agents, either through polling or at the request of an operator. The data is then combined in a VAX Rdb/VMS or Ultrix/SQL database where it can be accessed by system managers.

The System Census GUI resides on the same VAX or Ultrix system as the Consolidator. It displays the configuration data as icons on a DECwindows Motif interface and allows users to scroll through multiple windows to view only as much information as they need to complete their task.

System Census applications will ship this month. Prices start at $300 for the Agent software, while the Consolidator is tagged at $53,000 for an unlimited number of Agent connections. The System Census GUI is priced at $10,600 for an unlimited number of users.

Another new Polycenter application is System Watchdog for VMS 1.0, a package that lets system managers automate problem detection, notification and correction procedures.

Like the System Census product, System Watchdog includes Agent and Consolidator modules. The Agent resides on each VMS system in the DECnet network and periodically scans the the system it resides on for problems or events, based on parameters set by the system manager.

The Consolidator polls the Agents, collects all information and presents it as a list of events and system status reports. It can send mail messages to system managers or to DECmcc Director, if the event is severe enough.

System Watchdog applications will ship in October. The Agent starts at $200 and the Consolidator is priced at $53,000 for an unlimited number of users.

Meanwhile, DEC released a new version of its DECathena software, which includes naming, security, system management, file system, mail, print, help-desk and conferencing services for multivendor distributed computing.

DECathena Version 1.1 includes support for Sun Microsystems, Inc. SPARCstations, Hewlett-Packard Co. HP-UX and IBM RISC System/6000 workstations, in addition to DEC Ultrix platforms. It can also now run on Sun Network File System (NFS) file servers, DEC Ultrix NFS and Andrew File System servers.

DECathena is priced starting at $45,000. Sun client and file server support features are shipping now. HP and IBM client support will ship in November and in January 1993, respectively.

Tivoli bolsters net mgmt. platform

continued from page 9

Analysts said the Tivoli applications were welcome additions to the company's management platform, pieces of which — such as the object-oriented database — were selected by the OSF for use in its Distributed Management Environment.

"These enhancements will let users act more quickly on trouble tickets and let third parties develop more applications to run on the system," said Jamie Lewis, vice-president of The Burton Group, a consultancy in Salt Lake City.

The new software products will be available Oct. 1.

Current Tivoli users will automatically receive free upgrades to the new software and tool kits. A starter package for a 50-node net, which includes Works, Courier and Sentry, will be available for $30,000. That same package starts at $375 per node for a 500-node net. ADE is priced from $26,500.

Recently the analysts looked into our UNIX strategy and discovered what sets us apart.

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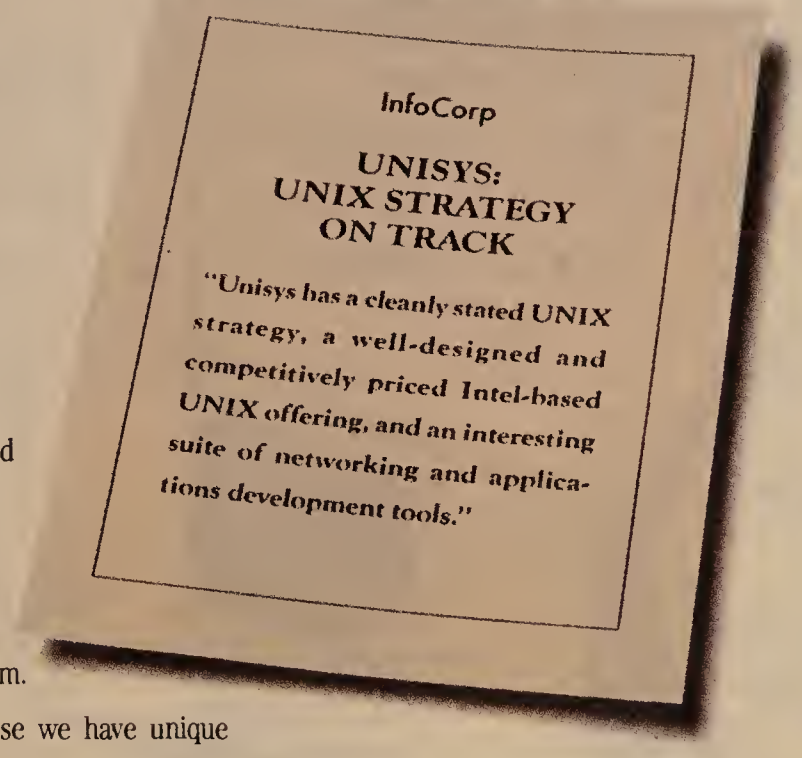

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It should come as no surprise that of the eight best 900 service programs recognized this year by the Golden Phone Awards, five were carried by AT&T.

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•

Best Business-To-Business Information Program:
Business Infoline
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•

Best Sports Information Services Program:
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Consumer Ski Report
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GLOBAL SERVICES

DOMESTIC AND INTERNATIONAL VOICE/DATA SERVICES, ACCESS EQUIPMENT AND REGULATORY ISSUES

Worth Noting

"In five years, 60% of all traffic headed to the U.K. will be carried over private lines that carriers resell to other carriers, who in turn sell it to users."

Daniel Briere
President
TeleChoice, Inc.
Montclair, N.J.

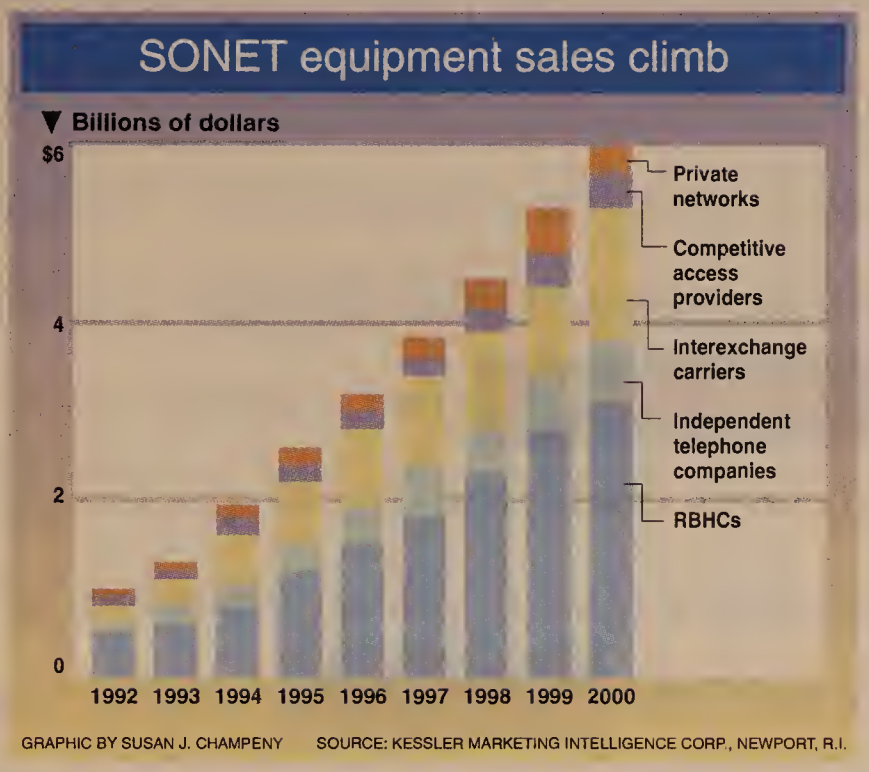
Regulatory Update

US West, Inc.'s latest project to take advantage of a court ruling last year that allowed the regional Bell holding companies to provide information services is an electronic directory the carrier unveiled last week.

The directory will be the equivalent of traditional white- and yellow-page listings for the Minneapolis/St. Paul area, including telephone numbers and addresses for residents, businesses and government offices. In addition to the standard informational listing, businesses will be able to pay for unlimited additional screens of information, which might include descriptions of services, sales or promotions. All information is updated twice a month.

The directory can be accessed via a personal computer or a specialized Minitel terminal manufactured by France Telecom through an electronic gateway, dubbed Community Link, announced last year. France Telecom is partnering with US West in the Community Link project.

Users can employ the directory to search for businesses within a specific geographic area or throughout a city. Users can also search by partial name, business type, or category of product or service.



LCI enters the international private-line service arena

Hopes to serve U.S. firms building global nets.

By Bob Wallace
Senior Editor

COLUMBUS, Ohio — LCI International last week detailed plans to offer a wide array of international digital services to Canada, Western Europe, the Far East and the Pacific Rim.

The services, which are available now and range in speed from 56K/64K to 1.544M bit/sec, will be provided over facilities leased from TRT/FTC Communications, Inc., a New York-based international carrier.

Exploring new frontiers

International services represent a new market for LCI, which currently operates an all-fiber network serving users in the Midwest and along the Eastern Seaboard.

The company created the services primarily for its banking, investment and financial services customers but hopes the offerings will enable it to win business from other U.S. firms building global networks.

"Thirty-five of our current customers ask for digital private-line services," said Scott Booth, network services manager for LCI. "In the past, we've told them to look elsewhere, whereas now we can meet their needs."

Daniel Briere, president of TeleChoice, Inc., a Montclair, N.J., consultancy, applauded LCI's plan.

"It's a good move for LCI and its customers," he said. "There aren't a lot of carriers doing international private-line resale right now."

Going my way?

The as yet unnamed services will carry one charge that comprises the cost of access to any of the carrier's 240 points of presence (POP) — which varies by distance — and the cost of transport to a midway point on an undersea cable. A foreign carrier charges for the second half of that link.

"Thirty-five of our current customers ask for digital private-line services," Booth said.

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LCI will use TRT/FTC's New York and Los Angeles gateways for overseas traffic and RCI Corp.'s gateway if the traffic is headed to Canada. The RCI gate passes traffic to a POP operated by Unitel Communications, Inc. — a Canadian long-distance service provider. LCI said it hopes to eventually forge a direct link to Unitel.

(continued on page 24)

Fate of T-3 in limbo for FTS 2000 users

WilTel says GSA has stalled in requesting new bids for offering T-3 service to gov't customers.

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — The fate of federal users hoping to add T-3 service to their networks is riding on a decision expected in the next two weeks on whether they can continue to purchase the service from the Federal Telecommunications System (FTS) 2000 contract.

By next week, the General Services Administration Board of Contract Appeals will issue a ruling on whether the GSA must discontinue sales of T-3 under FTS 2000 and, instead, open a competitive bid. If a new bid is required, it could be a year before government users can purchase T-3 service, according to Don Scott, associate administrator for FTS 2000.

The dispute arose in March after the GSA allowed AT&T to add T-3 service to its FTS 2000 contract. In August, the GSA Board of Contract Appeals countered by ruling T-3 had been improperly added as a service enhancement when it is a separate and distinct service that should be awarded through competitive bid.

WilTel, which protested the T-3 award to AT&T, said that despite expectations that the GSA would put out a new bid for T-3 service, nothing has happened. The GSA has not told AT&T to discontinue selling T-3 service under FTS 2000 or to disconnect

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ATC enhances features of its calling card service

By Bob Wallace
Senior Editor

ATLANTA — Advanced Telecommunications Corp. (ATC), a regional long-distance service provider here, has announced enhancements to its calling card service that include support for new calling and administration features.

ATC claimed that the number of subscribers to its OnLine calling card service, which was announced about a year ago, has grown by more than 25,000 per month.

Enhancements to the card will include the ability to initiate conference calls with an unlimited number of participants. Operators are available around-the-clock to assist and even transcribe calls, if necessary.

The service also now enables users to program as many as nine personal speed-dial numbers — whether domestic or international. Corporate users can program as many as 89 numbers, which card users can speed dial by pushing two digits.

OnLine's Message Delivery with Reply feature enables customers to leave a message for the called party when a number is busy or there is no answer. Message recipients can then record a response to be stored in the user's voice mailbox.

OnLine now has accounting codes and class of service features. Network managers can assign eight-digit Accounting Codes to clients or departments for charging back calling costs. The Class of Service Restrictions can be used to restrict a user's ability to call specific areas or numbers, or block use of certain features such as conference calling.

With Re-Dial on Busy, end users dial #99 and OnLine will redial the previously called number.

And ATC has been busy with more than just calling card enhancements.

In June, the firm announced plans to acquire LDDS Communications, Inc., a regional long-distance service provider based in Jackson, Miss. If approved, ATC would have a combined 1,850-route-mile network comprising 1,150 fiber miles and 700 miles of digital microwave, enabling ATC to offer a variety of network services to users in a 38-state region.

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LCI to offer private-line service

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The company will provide service to Belgium, Canada, France, Germany, Ireland, Italy, the Netherlands, Norway, Spain, Sweden, Switzerland, the U.K. and, in the Far East, to Japan, Hong Kong and Singapore.

According to Booth, LCI is also considering offering service to South American countries.

Ultimately, the carrier may purchase capacity on undersea cables, rather than resell TRT links.

"Buying capacity is an expensive proposition," Booth said. "We had a company that wanted to charge us $500,000 for one transatlantic DS1 channel. We're going to wait two to six months and decide if we want to continue to resell [TRT/FTC] capacity or buy our own."

LCI, based here, is a privately held company whose majority shareholders include two venture capital firms — E.M. Warburg, Pincus & Company, Inc. of New York and Primus Venture Partners of Cleveland.

Fate of T-3 in limbo for FTS 2000 users

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T-3 service already being provided to the Department of Energy at laboratories in Livermore, Calif., and Albuquerque, N.M.

Scott confirmed that the GSA has not instructed AT&T to alter its activity on T-3 service. He said it is not clear to the GSA how it is expected to proceed in the wake of the board's ruling on T-3 and, in the interim, his main interest is protecting the users.

"These customers have been waiting for this service for a long time — two years in some cases — and it didn't seem fair to me to cut those customers lose and send them into an elongated procurement action," Scott said.

Continued service for users

For federal users who either already had T-3 installed or had ordered it, Scott said his policy is to let them continue if they have an urgent need for the service. The National Aeronautics and Space Administration and Environmental Protection Agency had ordered T-3 service from AT&T, but they did not have it installed when the board's ruling came out.

"If they had staked all of their processes on having the service and if they didn't have it, it would have a serious impact on their operations, and we ought to try and provide it," Scott said.

> "Government agencies that need to have these high-bandwidth services connected efficiently are instead being guided down a dead-end street by GSA," Martens said.
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Since the GSA has not moved forward to discontinue T-3 service under FTS 2000, WilTel filed a motion with the GSA Board of Contract Appeals, asking that the agency be forced to take those steps.

WilTel, whose complaint about the addition of T-3 service to FTS 2000 prompted the board's ruling, said users are being hurt by the GSA's inaction. "Government agencies that need to have these high-bandwidth services connected efficiently are instead being guided down a dead-end street by GSA," said John Martens, senior vice-president of commercial sales and government systems at WilTel.

WilTel's motion asks that the GSA terminate any T-3 circuits currently operational and prohibit AT&T from selling more T-3 service under the contract. WilTel asked for an expedited procurement but is willing to let current FTS 2000 customers receive T-3 service until that procurement is completed.

AT&T officials have said they will resist disconnecting T-3 services in operation now and will go to court, if necessary. AT&T has already asked that the GSA Board of Contract Appeals decision be overturned.

The stakes are high for everyone involved. The value of the T-3 services that federal users are expected to purchase over the next six years is at least $100 million, according to the ruling of the GSA Board of Contract Appeals.

In addition to the magnitude of the business, there are important legal stakes for AT&T. The resolution of this dispute may set a precedent for the addition of other services, such as Frame Relay or Switched Multimegabit Data Service to the FTS 2000 contract.

ENTERPRISE APPLICATIONS

CLIENT/SERVER AND ENABLING SOFTWARE: DISTRIBUTED DATABASE, MESSAGING, GROUPWARE AND IMAGING

Worth Noting

"E-mail used to be a way to exchange messages; now it has become the engine for distributing all kinds of information within companies."

Walter Ulrich
Director
Arthur D. Little, Inc.
Los Angeles

Store & Forward

Information Builders, Inc. recently announced that its front-end development tool, Focus, now supports an interface to Oracle Corp.'s relational database management system running on Hewlett-Packard Co.'s 3000 series Unix processors.

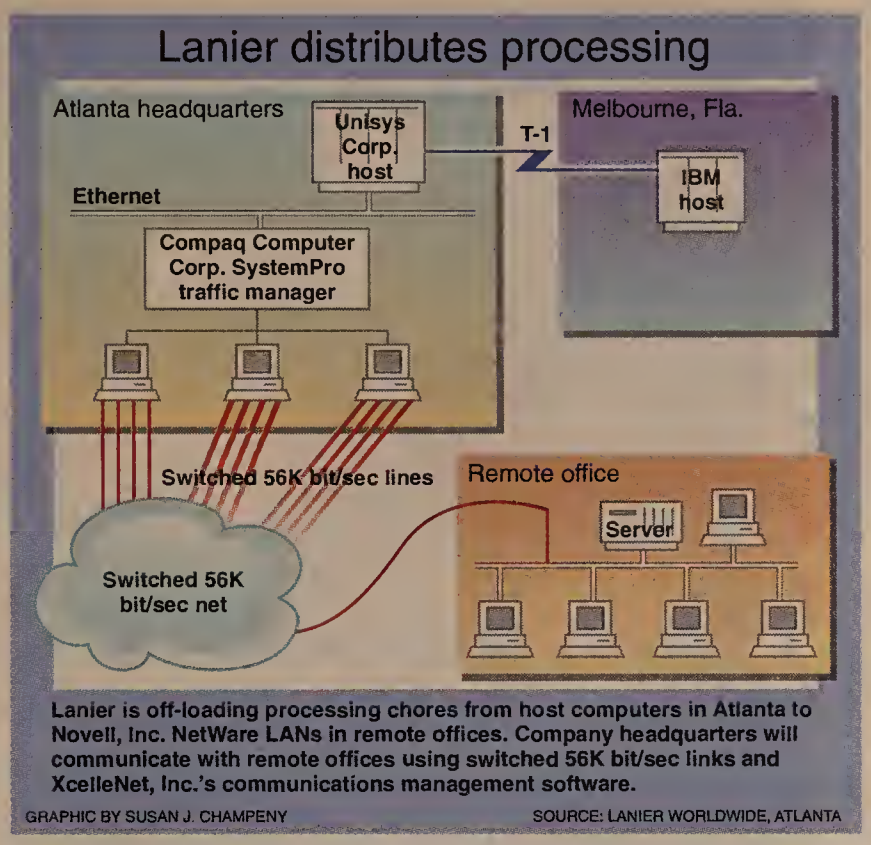
The new Focus interface will be available in the fourth quarter and costs between $740 and $29,400, depending on user configuration.

Elan Software Corp. recently updated Goldmine, its contact management software, with enhanced group scheduling capabilities and improved security. Version 2.5 also supports an unlimited number of contact names and addresses.

Available now, Goldmine 2.5 costs $295 for a single-user and $895 for a five-user network version.

Campbell Services, Inc. recently unveiled a new version of OnTime for Networks, a group scheduling tool that runs on Novell, Inc.'s Message Handling System (MHS) nets.

The new version supports reconciliation features that keep remote users' OnTime calendars up-to-date with a main calendar. Pricing starts at $297 for a three-user DOS version and $56 for a three-user Windows version.



Lanier is off-loading processing chores from host computers in Atlanta to Novell, Inc. NetWare LANs in remote offices. Company headquarters will communicate with remote offices using switched 56K bit/sec links and XcelleNet, Inc.'s communications management software.

GRAPHIC BY SUSAN J. CHAMPENY SOURCE: LANIER WORLDWIDE, ATLANTA

Lanier to profit from move to distributed applications

Firm is off-loading processing to remote LANs.

By Wayne Eckerson
Senior Editor

ATLANTA — Lanier Worldwide is in the midst of off-loading some processing chores from hosts here to LANs at remote offices to cut communications costs, increase operational efficiency and improve response time.

The international distributor of office automation products is replacing terminals at 150 offices throughout the U.S. with personal computers linked in Novell, Inc. NetWare local-area networks. PC users will be able to access order entry, inventory and shipping applications on local servers instead of logging on to remote systems.

Lanier is replacing its multidrop leased-line network with a switched 56K bit/sec net.

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To support the distributed applications, Lanier is replacing its multidrop leased-line network with a switched 56K bit/sec network controlled by XcelleNet, Inc.'s RemoteWare Communications Management System.

RemoteWare is software that manages communications with remote offices via dial-up links. With the software, users can upload or download files at predefined times, distribute and synchronize software across a network, access remote databases and exchange electronic mail.

"In a year from now, we plan to have remote offices enter orders and run inventory applications on their PCs and then batch upload the information via XcelleNet each night," said Steve Breithaupt, vice-president of information services at Lanier.

RemoteWare comes with special software for remote servers that acts as a gateway for host access. The server software works on any Network Basic I/O System-compatible LAN.

Breithaupt said using switched 56K bit/sec lines will enable Lanier to exchange information with remote sites much more cost-effectively and efficiently than multidrop leased lines. He estimated the company will save hundreds of thousands of dollars in communications costs alone.

"We can transfer entire databases from all 150 sites at a fraction of the cost of supporting a leased-line network," he said.

XcelleNet's RemoteWare will also considerably reduce Lanier's postage, printing and mailing

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DEC to detail E-mail reformatting utility

Converts text, spreadsheets, graphics to let users of diverse applications exchange information.

By Wayne Eckerson
Senior Editor

LANDOVER, Md. — Digital Equipment Corp. is expected to announce soon a utility that handles file reformatting within E-mail messages, allowing users of a variety of applications to exchange information transparently, *Network World* has learned.

The MailBus Conversion Manager for VMS automatically converts text documents, spreadsheets, graphics and image files into formats specified by mail recipients on diverse systems. For example, a personal computer user can create an electronic mail message with Microsoft Corp.'s Word, attach a Lotus Development Corp. 1-2-3 spreadsheet and transmit the message across an X.400 backbone network. The MailBus Conversion Manager software could reformat the document into WordPerfect Corp.'s WordPerfect word processing format and the 1-2-3 spreadsheet into DEC's DECalc format.

"Most messaging systems today permit the exchange of unformatted text or binary files, but no message product reformats for text, spreadsheets, graphics or images on the fly," said Steve Farowich, director of service delivery at DEC here.

MailBus Conversion Manager runs on a VAX VMS minicomputer along with the VAX Message Router, a message transfer agent that forms the heart of DEC's MailBus message system. The Message Router provides transfer, directory and management services, and is the messaging engine that routes messages to their destinations across a network.

"One of the banes of E-mail interconnection is how to deal with attachments, such as spreadsheets and word processing documents," said Walter Ulrich, E-mail consultant and a director at Arthur D. Little, Inc. in Los Angeles. "DEC's product is an excellent way to handle the conversion of attachments without burdening users."

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Ingres preps new release of its Ingres/Windows 4GL

By Timothy O'Brien
West Coast Bureau Chief

ALAMEDA, Calif. — The ASK Companies' Ingres division next week will announce a new version of its fourth-generation language that widens the range of front-end applications that work with the Ingres Server database server.

According to sources close to the company, Ingres/Windows-4GL Version 2.0 will enable users to build applications that use IBM's Presentation Manager and Hewlett-Packard Co.'s OpenLook. It will also feature enhancements such as an interactive debugger and a simplified programming interface.

Other graphical user interfaces (GUI) already supported by Ingres with the fourth-generation language development tool include Microsoft Corp.'s Windows, the Open Software Foundation, Inc.'s (OSF) Motif and Digital Equipment Corp.'s DEC Windows.

Ingres/Windows4GL combines an object-oriented fourth-generation language and an application manager component that supports team programming. Applications created in this environment serve as clients that work in conjunction with the Ingres Server database, which runs on local-area network servers, Unix machines or DEC VAXes.

The product is designed to aid users developing applications for multivendor environments. Ingres/Windows 4GL applications are portable across many different operating systems and window environments. For example, an application developed under Windows will dynamically

(continued on page 28)

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LAN TIMES READERS CHOICE 1992

cc:Mail allows you to send messages transparently and maintains a consistent set of features across all these major platforms. That's because it was built from the ground up to support network environments made up of different platforms and LANS—a design consideration that seems to elude most e-mail systems. Further, it's the only system that gives you a wide range of options for enterprise-wide connectivity. cc:Mail can even exchange mail messages with most mini and mainframe mail systems such as IBM® PROFS® and offers gateways to public e-mail services such as MCI Mail.® And cc:Mail runs smoothly on any server or network operating system, in any configuration. All of which makes it easier for you to maintain, administer, and install. And put your faith in.

cc:Mail offers an impressive set of administration tools. Such as Automatic Directory Exchange, a product which automatically collects any changes made to the directory and updates the entire network. It's also the

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nic mail package
roval from everyone.

first package of its kind that's built on a new, fully scalable messaging architecture. Which means it can accommodate 5 to 500,000 users. And grow along with your business. One more thing: cc:Mail has won every major industry award, including the Windows Magazine 1992 WinAward and ComputerWorld's 1992 LAN Brand Preference award.

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DEC to detail reformatting utility

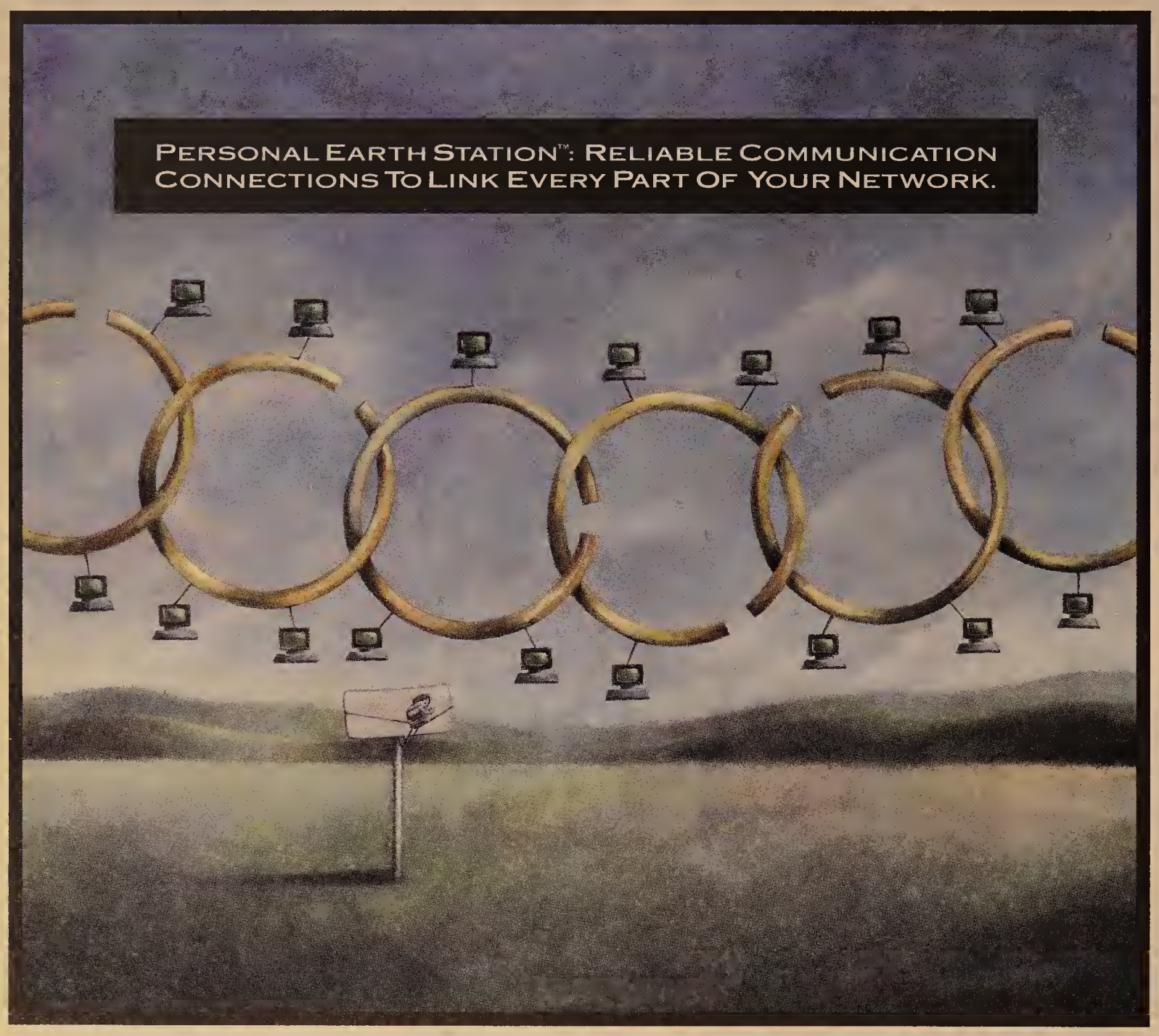
continued from page 25

Users list preferred file formats in the Message Router's directory, which also contains their E-mail address, phone number and other information. For each incoming message, the MailBus Conversion Manager determines which files need to be reformatted and then checks the Message Router's directory to determine the appropriate file formats.

It then invokes command-line converter software, also located on the VAX, to translate the files. MailBus Conversion Manager then rebuilds the message and hands it over to the Message Router, which delivers it to its destination.

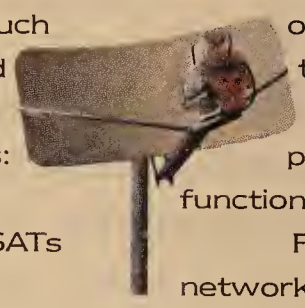
The MailBus Conversion Manager works with DEC's Compound Document Architecture Converter Library, Keyword Office Technologies, Inc.'s KEYpack conversion software and other converters that run on VMS. These converters support a variety of word processing, spreadsheet and graphics formats, such as Apple Computer, Inc.'s MacWrite and Word for Macintosh Version 4, Microsoft Corp.'s Word for Windows 1.1 and 2.0, and MS Word 4.0 and 5.0, among other things.

MailBus supports gateways to X.400, Novell, Inc.'s Message Handling System (MHS), the Simple Mail Transport Protocol and IBM's Professional Office System, OfficeVision and Systems Network Architecture Distribution Service (SNADS) message systems. Users whose mail systems can access these message systems can take advantage of MailBus Conversion Manager. The software costs $10,000 and is shipping now.



Today, top organizations around the world have turned to satellite communications as an affordable, high-quality source of LAN interconnection for their business networks. In fact, for 70% of interactive VSAT installations—in such industries as banking, retailing, energy and hospitality—the choice has been the international leader in satellite communications: Hughes Network Systems.

Hughes Personal Earth Station™ VSATs offer full data, voice and video services.



The system provides superior support for distributed processing such as broadcast file transfers, LAN internetworking, and interactive data applications. With full bandwidth available and supplied on demand, it offers a true LAN*Advantage*™ to handle bursty LAN traffic. Our graphics-based network management system provides full support for common network functions and value-added applications.

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Lanier to profit from distributed apps

continued from page 25

costs. RemoteWare will enable Lanier to electronically distribute reports and manuals instead of mailing them to offices.

Lanier will also be able to create electronic templates of commonly used business forms, such as timesheets, payroll changes and requests for supplies. Once individuals complete these forms, the information is automatically uploaded to the proper database.

In addition, the high-speed dial-up links will enable Lanier to transfer images across the network. Lanier plans to have field offices upload a variety of documents, such as sales contracts, leases and sales tax exemption certificates, as images across the network rather than sending them via postal mail to its home office.

The company also said it is planning to use XcelleNet's E-mail utility to improve communications among staff at remote and home offices, and its software distribution utility to ensure all remote offices are running the same software version on their computers.

Lanier has three XcelleNet servers, which are IBM Personal System/2 Model 95s, at headquarters to communicate with XcelleNet servers in remote offices. Each IBM PS/2 server can handle as many as five simultaneous switched 56K bit/sec sessions or 16 simultaneous 19.2K bit/sec sessions. The PS/2s are serially linked to a Compaq Computer Corp. SystemPro computer, which is attached to an Ethernet network. The Compaq computer acts as a traffic cop, managing the flow of traffic to and from hosts and the XcelleNet servers.

Breithaupt said he is currently running asynchronous analog traffic across switched 56K bit/sec links but will eventually run synchronous traffic once a vendor develops a data service unit/channel service unit card that separates dial tone from digital data traffic.

Synchronous traffic would enable Lanier to consolidate multiple 56K bit/sec channels to create fractional T-1 service. Currently, with asynchronous traffic, Lanier's network can only support dial-up speeds up to 57.6K bit/sec.

Ingres preps new Ingres/Windows 4GL

continued from page 25

adopt the look and feel of OSF's Motif interface when run on Unix workstations.

One of the other distinguishing features of the fourth-generation language tool is that it will allow multiple programmers to work in teams on the same application. All phases of application development will be managed by the Application Manager facility, which supports concurrency control, versioning and an interactive test environment. Ingres has added a debugging capability to Version 2.0 that will assist developers in testing and modifying applications. In addition, the new version will offer a new user interface, which should make the tool easier to use and more flexible for developers.

No information on pricing was available at press time. Version 2.0 will be available in the next few months.

INDUSTRY UPDATE

VENDOR STRATEGIES, MARKET TRENDS, ALLIANCES AND FINANCIALS

Worth Noting

"Cisco's going to give IBM a run for its money."

Steve Simon
Senior
telecommunications engineer
The Travelers Corp.
Hartford, Conn.
Commenting on Cisco Systems, Inc.'s proposed Advanced Peer-to-Peer Internetworking technology as an alternative to IBM's Advanced Peer-to-Peer Networking protocol

People & Positions

The **SMDS Interest Group** last week announced that **Steve Starliper,** director of Switched Multimegabit Data Services at Pacific Bell, has been elected as the vendor group's new president.

He replaces **Paul Froyd,** formerly of Bell Atlantic Corp.

Northern Telecom, Inc. (NTI) has announced several executive changes.

Michael Camp has been named vice-president of data networks in NTI's Business Networks Marketing organization. He will be responsible for all sales, marketing and support services related to the company's wide-area network product line.

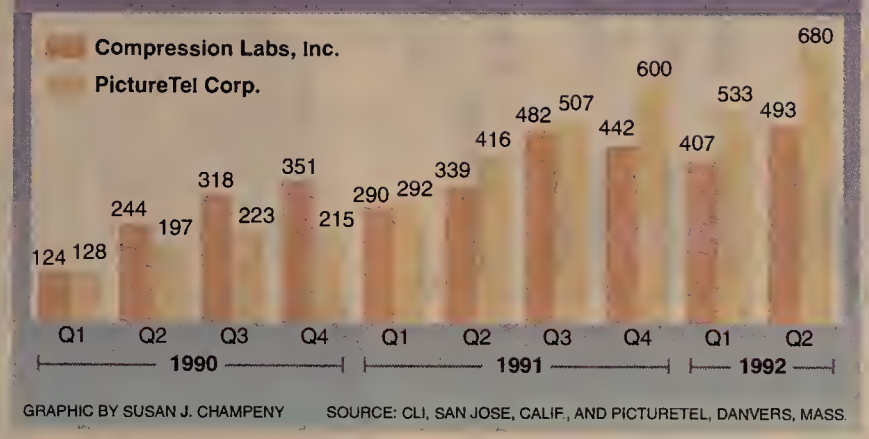
He succeeds **Michael Doss,** who has been named the company's vice-president of information networks. Doss will be responsible for NTI's telecommunications and computing facilities.

Also, **Dennis Matteucci** has been named executive vice-president of business network marketing. He will be responsible for the development and implementation of marketing strategies for the company's voice and data private network products. In addition, he will oversee existing and future joint ventures.

Previously, Matteucci held the post of vice-president of data and networks marketing.

The picture of health?

Combined videoconferencing codecs and systems shipped



GRAPHIC BY SUSAN J. CHAMPENY SOURCE: CLI, SAN JOSE, CALIF., AND PICTURETEL, DANVERS, MASS.

One-stop shop meets users' nationwide cabling needs

By Bob Brown
Senior Editor

HOUSTON — The Asset Group, an alliance of network integrators here, next week will announce plans to offer users a single source for their nationwide office cabling needs.

The Asset Group plans to leverage the expertise of national and regional cabling experts to offer users national network design and implementation services, according to Jack Atwell, president of the alliance.

The group will work with cabling outfits that have expertise in all of the major cabling and de facto standards, including ANSI standards, as well as IBM and AT&T cabling schemes, an Asset Group spokeswoman said.

In addition, the group will coordinate cabling for both local- and wide-area networks.

Additionally, the group will provide on-site cabling maintenance with four- and eight-hour response time options, and conduct cabling audits to help users identify potential problems. The group plans to emphasize fiber-optic cabling as an increasingly significant networking technology.

The cabling program will be introduced at the Association of Banyan Users International meeting in Boston Sept. 20-23. The Asset Group is designing the show's network, which will support electronic mail and groupware, among other applications.

The group will also announce at the show strategic alliances with Lotus Development Corp., Reach Software Corp. and Tricord Systems, Inc.

INDUSTRY BRIEFS

Dowty changes hands. Cray Electronics Holdings plc, a data communications equipment firm in the U.K., last week announced it has acquired the Information Technology Division of Dowty Group plc from TI Group, a U.K.-based aerospace firm.

Cray paid about $90 million for the Dowty Information Technology Division, which includes Dowty Communications, Inc., now Cray Communications. That unit sells packet switches, modems and other local- and wide-area network products, and has operations in the U.S., Europe and the Pacific Rim.

Cray Communications plans to move ahead with a new product rollout scheduled for the fall.

ADC Kentrox goes wireless. ADC Kentrox, based in Portland, Ore., has formed a new Wireless Systems Group that will be dedicated to developing wireless wide-area network products. The group, to include 10 engineers, will investigate many wireless technologies, including radio and microwave.

PictureTel, CLI stock takes heavy beating

Year-long slide attributed to revenue shortfalls, delayed product shipments, but sales still strong.

By Ellen Messmer
Washington Correspondent

WASHINGTON, D.C. — The stock prices of the two leading vendors of videoconferencing equipment have plummeted on Wall Street in recent months, leading many to ask whether their glory days are over.

PictureTel Corp. and Compression Labs, Inc. (CLI), which together account for about 80% of the market, have watched their stock slide over the past year due to problems ranging from lower than expected earnings to delayed product shipments. But both companies are still setting new records for equipment sales, despite a shaky world economy.

In late August, the price of PictureTel stock dropped 27%, becoming Nasdaq, Inc.'s most traded stock, as it sank from 15½ to 11¼. The reason for the decline was that the company announced that its annual revenue would not meet the $150 million goal expected by financial analysts.

A PictureTel spokesman attributed the revenue shortfall to the slow start of the company's new international divisions in Germany and Japan, which were launched last spring. PictureTel is now predicting that revenue will reach as high as $145 million by year end, a hefty increase over 1991 revenue of $78 million. The company expects to ship 4,000 videoconferencing coder/decoders and systems this year, as opposed to 1,805 in 1991 (see graphic, this page).

CLI's stock has also taken a beating, dropping from a year high of 35¼ to a low of 5¾ in August after news that the company posted a $2.2 million second-quarter loss, despite record revenue of $26.9 million, a 65% jump over the second quarter in 1991.

The stock drop triggered a spate of lawsuits on behalf of disgruntled shareholders. John Tyson, chairman and chief executive officer at CLI, indicated the action was instigated by law firms that mechanically fire off lawsuits when a company's stock appreciably drops in an attempt to collect on the company's liability insurance.

"We're strongly convinced we've been fully compliant in our disclosure requirements," Tyson said.

He attributed CLI's earnings woes to two factors.

"There was a sizable shortfall in our international business," Tyson said, acknowledging that CLI's delay in shipping its codec upgrade based on the H.261 international videoconferencing standard depressed business. International sales formerly represented 25% of CLI's business but dropped to 10% in the last quarter.

A second factor was an increase in the number of videoconferencing systems sold through CLI distributors, as opposed to direct sales, he explained.

> Both companies are still setting records for equipment sales, despite a shaky world economy.
>
> ▲▲▲

"In the past, 70% of our sales were direct, but now we've seen indirect sales jump to 50%," Tyson said. Sprint Corp. and Norstan, Inc., as well as the regional Bell holding companies and long-distance companies, are becoming important outlets for CLI's videoconferencing products.

Although indirect sales are contributing to an overall growth in sales, CLI is discovering distributorships to be a mixed blessing since they demand equipment discounts and still require substantial technical support.

Scott Douglas, an analyst with Telemanagement Resources, Inc., a Lake Wylie, S.C., consulting firm, said distributorships are destined to become important sales channels as the videoconferencing market expands and direct sales no longer suffice to reach prospective buyers.

(continued on page 47)

Network tall buildings in a single bound.

With Chipcom's ONline™ System Concentrator you can connect a tall building or a far-flung campus with a seamless, unified and totally reliable network. A network that is truly self-healing, and capable of surviving multiple faults, from broken cable to failed modules or power supplies.

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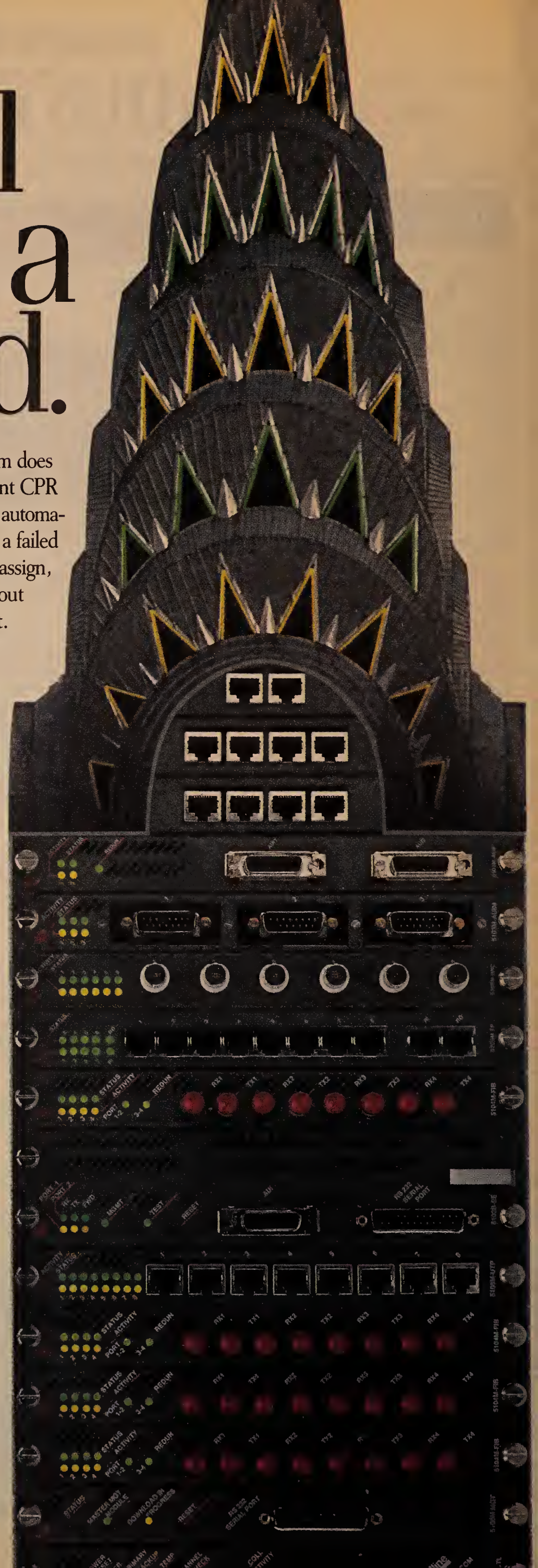

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MANAGEMENT STRATEGIES

MANAGING PEOPLE AND TECHNOLOGY: USER GROUPS AND ASSOCIATIONS

Worth Noting

"Investments in our network need to get a payback in 18 months. And 18 is at the long end. If it's longer than that, it's hard to justify."

Thomas Festa
Communications director
Liberty Brokerage, Inc.
New York

Manager Minutes

American Management Systems (AMS) and **Carnegie-Mellon University's** Graduate School of Industrial Administration (GSIA) announced that the awards ceremony for the Fifth Awards for Achievement in Managing Information Technology will be held Nov. 10 in New York.

The awards recognize senior executives who have made significant contributions to their organizations through effective use of information technology.

For more information, call (703) 841-6000.

Technology Transfer Institute (TTI) and **Holland Systems Corp.** are sponsoring the 2nd International Conference on Strategic Information Planning. The conference, to be held Oct. 26-28 in Orlando, Fla., will focus on business reengineering and quality management.

Among the topics to be discussed are identifying reengineering opportunities, integrating business reengineering and strategic data, measuring the business success of information technology, and improving technical implementation through strategic planning.

The conference costs $995 per registrant. For more information or to register, call TTI at (310) 394-8305.

ADCU, CMA merger builds on user groups' strengths

Members get stronger voice on network issues.

By Joanne Cummings
Senior Writer

BERNARDSVILLE, N.J. — There is strength in numbers.

The simple truth of that old adage was one of the driving forces behind the recent merger of the Association of Data Communications Users (ADCU) and the Communications Managers Association (CMA).

According to Ron West, president of ADCU, the merger will benefit members of both organizations by bolstering their numbers and consolidating their efforts, giving them a stronger, more united voice in networking issues.

"ADCU initiated the merger because we realized there was a large crossover in membership between the two organizations," said West, who is manager of telecommunications and office automation at Shearman & Sterling, a New York law firm. "People were being pulled in too many directions. We wanted to consolidate our efforts, and CMA seemed a logical group to merge with."

West, who is also a member of CMA, said he had noticed the technologies ADCU was interested in were becoming part of CMA's charter. "In just the past year, CMA has been focusing much more on LANs, bridging and routing, network management, [Switched Multimegabit Data Service] and cabling," West said. "These are big issues for voice, and it makes sense for us to pool our efforts."

To ensure that CMA continues to address ADCU's needs, Janet Hufton, ADCU vice-president and a senior consultant for KPMG Peat Marwick in Philadelphia, will serve as an auxiliary CMA board member until new officers culled from the ranks of both organizations are elected next year.

West said another reason behind the merger was ADCU's dwindling membership in recent years, from a high of about 200 companies in the mid-1980s to just 120 this year. The merger will expose members to a broader base of technologies and users, he said. CMA's membership will total approximately 330 companies when the ADCU membership is folded in.

Current ADCU members will automatically become members of CMA beginning this week. Next July, they will be required to pay a membership fee of $300 to stay in the organization. Although the ADCU members would have needed to renew in December for $250, West said they can now wait for the CMA's July renewal period.

CMA's Telcom 92 conference, slated to be held Oct. 19-22 in New York, will be the first to represent the combined organization. It will offer educational seminars and tutorials, and spotlight products and services from more than 200 networking vendors. For more information, contact CMA at (908) 766-3824.

EXECUTIVE BRIEFS

Help in the hiring process. Source Edp, a recruitment firm specializing in the placement of computer professionals, has published its *Hiring Guide,* a book that offers managers tips on hiring qualified candidates and conducting thorough reference checks.

The guide outlines several steps for completing accurate and informative reference checks, and provides samples of questions designed to increase the information garnered from a reference.

The book also contains tips on attracting qualified candidates, conducting revealing interviews, comparing and contrasting candidates' strengths and weaknesses, making job offers and evaluating employee recruitment firms.

For a free copy of the guide, write to Source Edp at P.O. Box 152109, Irving, Texas 75015, or call (214) 717-5005.

ITT Sheraton's Rita Hedgespeth, Charles Arbeely of John Hancock Insurance and Gerry Nadeau of GTE Government Systems.

Net managers discuss software purchasing

IS executives talk about how networking has reshaped the process of buying applications.

The way users buy networking software is changing.

Not only has networking reshaped the criteria for buying software, it has also changed the role of network executives in the software buying process.

In the second part of a special two-part interview, *Network World* Editor John Gallant and Senior Writer Joanne Cummings talk with information systems managers from several Boston-area companies about the software issues they're facing today.

Can you explain how the process of buying software for network environments works in your company?

Houghton LeRoy, principal network engineer, The Foxboro Co.: One way we gather information about which software to purchase is through our monthly network user group meeting. We have representatives from various departments who meet and discuss their requirements, particularly what software might be useful to improve their productivity. Representatives are assigned by department managers. It's usually someone who can represent the whole department.

Is the job of the group to select software that can be used throughout the corporation to set standards?

LeRoy: Yes. And the development group, the financial group, the manufacturing group, etc., all have representatives that supply input. Someone may say, "I want to try Excel." So we'll put Excel up on the network and see if it works out well.

Who makes the ultimate purchase decision?

LeRoy: Our corporate information systems.

Allan Elkowitz, director of information technology, Children's Hospital: We're in a major transition right now. Before, we had a top-down decision system, where the VP of IS or two or three techno-gurus from the department would make a declaration about what the institution was going to do, and that was it. The user departments always had limited say.

We're moving today to a much more cooperative system. When something major is needed, like a new financial system, a task force is put together that includes IS and the appropriate departments.

We also have a user services group now, which is responsible for working with smaller needs issues. So if a department needs something, the user services group will provide both technical and consulting assistance to make sure standards are adhered to.

Rita Hedgespeth, IS audit manager, ITT Sheraton Corp.: Our organization has gone through a significant transition. Six months ago, we were in an environment where the IS group basically tried to steer everyone toward the products they wanted to support. Now the user group is much stronger in determining what will be implemented.

Don Davis, manager of microcomputer support services, Boston University: I do evaluations and make recom-

(continued on page 32)

Net managers discuss software

continued from page 31

mendations to the departments I support, but I have no enforcement. They can still go out on their own.

My only control is I tell them I may not be able to support them if they go out into exotica. It usually works, especially when we're talking about network applications where what they buy may have a major impact on other departments.

What are some of the roles different IS professionals — such as LAN administrators or data processing personnel — play in the process?

Charles Arbeely, systems analyst, John Hancock Insurance Co.: I'm the LAN administrator. I'm given certain standards to work within, and from there, it's up to me [what runs on the LAN]. Corporate sets the overall standards for the company, and if we go outside those boundaries, we are on our own support-wise.

Who sets the corporate standards?

Arbeely: Mostly people like myself — LAN administrators, techno-guru types.

What do you do if you don't agree with the standards?

Arbeely: We have monthly meetings where we can discuss it. If it's something we're completely against, we'll go our own direction.

At what cost?

Arbeely: [Corporate IS] will try to help us, but the first thing they'll say is that we should have gone the standard way. There have been points, though, where we've gone our own way and haven't had a problem.

Gerry Nadeau, information management supervisor, GTE Government Systems: We offer groups the opportunity to put on the network what they think is going to work best for their departments. We offer standards as a benefit to the end users. But if it doesn't meet their needs, certainly we don't hold them back. We try to work with them and give them the opportunity to make the network work.

What's your involvement in their needs analysis?

Nadeau: We're a consulting service for them. Our role is to work with them and advise them to ensure that things function compatibly with the rest of the network.

Dennis Sullivan, assistant vice-president, Scudder, Stevens & Clark: In our firm, we have some networks that are managed by IS and other LANs that are set up, administered and budgeted under the control of local departments.

We try to give users the flexibility to run what they need on the network, but at the same time, we try to facilitate cost efficiencies, like volume purchases, through IS.

We also try to get involved in the process early and make sure that things are network-compatible and that information can get back and forth among applications as it needs to.

We have biweekly meetings in which we call in the users and find out if what we're planning for the network will support what they're planning. We also try to whittle down the list of available products so we don't have too many different kinds of word processors or spreadsheets running at the same time.

As you start moving away from monolithic nets to more distributed models, standards become key.

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For the most part, do people choose to live within the standards set by corporate IS?

William Harrison, director of networking and systems support, Dana-Farber Cancer Institute: If the standards don't meet their needs, they'll go their own way.

We've run into huge problems with people running their own databases. They'll go out and pay somebody to develop [a database application] and put it on the network. Then when they run into problems with performance, they look to us and say, "Hey, this doesn't work properly." But we had no control or say in the development of it. That's a huge problem with us, and we're trying to get some kind of involvement in that.

Nadeau: The real dilemma in a lot of IS shops is whom do you buy for? Do you buy for the individual, the company, the division? Each one of those levels has its own needs that might not always be met by a software purchase. I don't know anybody anywhere that has come up with a real consistent methodology that lets you meet the individual's needs as well as the enterprise's needs at the same time.

How has the software purchase process changed over the past couple of years or so?

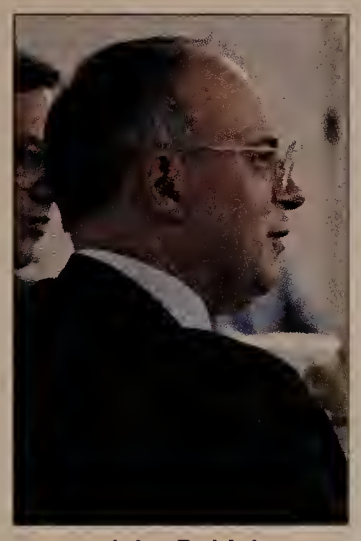
Harrison: There's more end-user involvement, and maybe that makes our role more crucial. There is a lot more input from the customers vs. when IS was completely centralized. Now our customers have become part of IS. We depend on them to know the best applications, and that helps determine what we purchase.

Psychologists call something that runs continuously, without pause or interruption, an obsession.

(When the same thing happens on your network, it's called the LinkBuilder ECS hub.)

Sullivan: The users are driving more of the decisions about things like word processing and desktop publishing applications, where network compatibility or interoperability aren't jeopardized. But IS makes the decisions about wiring things such as operating systems or protocol-level products. We've opened up the applications at the higher level of the model.

We care about the infrastructure kinds of products. But as far as applications go, we'll facilitate a forum for users to evaluate information and find out what sounds good to them. We split the decision making.



John Dubiel

What types of software are considered infrastructure?

Sullivan: Network operating systems, utilities that run on the server, network management systems. Electronic mail is sort of a crossover. We've suggested that users standardize on [Lotus Development Corp.'s] cc:Mail. We're looking to see if it satisfies their needs to send research information, for instance, across the network. If it does, we'll go with it.

What about database products? Is that an infrastructure decision?

Sullivan: I would think of that as an application decision. In our company, IS does not develop applications for servers unless it's a strategic application such as portfolio management, which cuts across several departments.

But if a department wants to track its employees using dBase, Paradox or some kind of Sybase [Inc.] database, if they can afford it, they can make the decision.

John Dubiel, manager of planning and technology, Boston Edison Co.: It's different for us. Things like Sybase or Oracle [Corp.] database server applications are infrastructure in our company. But mainly, that's because we're writing applications to go on the client and server sides.

As you start moving away from large monolithic-type network models to more distributed models, standards become key to having a manageable network. If you don't have these standards or you don't adhere to them, then you get a real management nightmare on your hands. Then you're not downsizing, you're upsizing.

Gerry Nadeau

Hedgespeth: The amount of standardization has a lot to do with how much support IS actually provides the user. If IS is writing the application, then you develop a more standardized set of tools because that's the way you save money — having people who have specific skills who can support multiple departments with applications built using those skills.

But we are finding that a lot of our LAN software is written by outside consultants.

When you're in that framework, you have only limited control over the kind of database product or application development tool people use. But support is also purchased from that same [consultant], and you're not expected to support the product internally.

Do your standards extend to specific product brands?

Davis: Mine do. I actually come out with a title and version number.

Elkowitz: In some cases, yes.

We draw an artificial line of what's infrastructure and what's not, and then we set brand-name standards for the infrastructure products.

If you could go back and change something about the software purchasing process in your company, what would you do?

Dubiel: I would ask for electronic distribution of software. I never want to see another floppy disk as long as I live. It would just make life much easier when doing upgrades and things like that.

LeRoy: One thing I'd like to see is some [improved] support structure. Frequently, you just can't get through to vendors. There's got to be a better way of supporting the software.

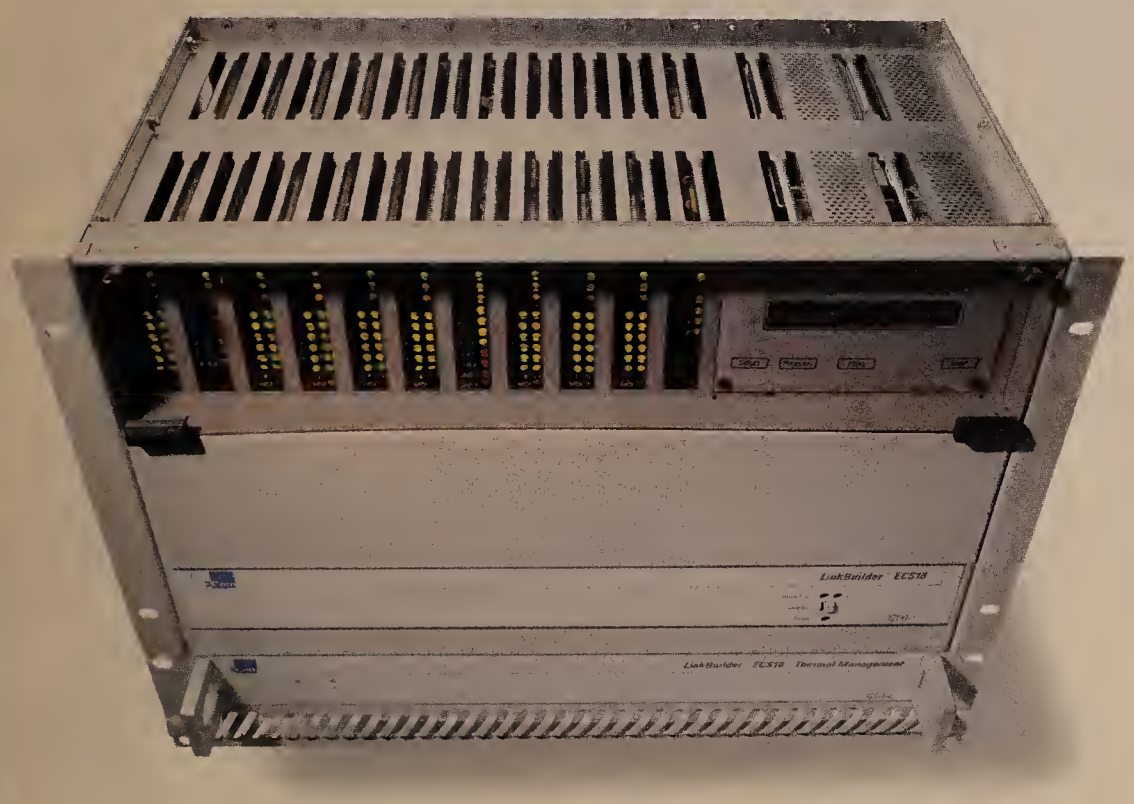
Davis: Right. If they want to sell a product, they should provide some sort of special corporate support because I don't have the time to dial a number a thousand times a day.

Sullivan: If there's a list of known bugs, tell us about it. They need to be able to get information out to users about known problem situations. The last thing we want is to spend anymore time on the phone than we have to just to get information on a problem they knew about already.

Dubiel: If you have a corporate license, why can't they fax you [information on] the bugs as they come up? Don't make me guess or wait for it to hit.

Elkowitz: Our entire production VAXcluster goes down at 2 in the afternoon. We call for help, and they say, "Oh yes, that's a known bug, and here's the patch for it." And I'm ready to kill somebody.

LeRoy: Also, they have to realize we're in a networking environment. I'll let vendors dial up, look at my problem and fix it over the phone if they want to provide support for us. Most of these software companies are not equipped to do that and have no intention of doing that.



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SNA ISSUES

BY ATUL KAPOOR

IBM should do the right thing for APPN licensing

IBM's licensing policy for Advanced Peer-to-Peer Networking, disclosed at the recent APPN Developers' Conference, will have a major impact on users' ability to implement APPN in multivendor open environments. IBM is attempting to provide open solutions to its customers and still realize profits for proprietary inventions achieved through expensive research and development. Thus, its reportedly excessive licensing fee could have the unintended effect of discouraging third-party software developers from licensing the technology.

A licensing fee, by definition, indicates a closed architecture. A nominal fee may have made APPN a de facto open architecture. However, IBM is reportedly asking for a $400,000 license fee, plus a royalty fee, for each system sold. Although the price is high, it is still a fraction of what it would cost a third-party vendor to develop equivalent software through reverse-engineering. The problem is that a $50,000 sticker price on a Mercedes Benz 500 may be a great bargain for some, but that price is irrelevant to those who can only afford, or are in the market for, a Chevy. For most vendors, APPN's $400,000 license fee is too high.

> The fact is that IBM has never been open when it comes down to its crown jewels.
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Besides, it's not clear that third-party software vendors even want a license for the complete APPN architecture. Router vendors, for example, already have well-established backbone architectures with flow control, alternate routing and network management, and it's not a given that APPN Network Node-to-Network Node protocols will be more efficient or superior to those existing router implementations. Nor would these vendors be able to afford the cost of training and maintaining the hordes of systems engineers and support staff necessary to develop and support a full APPN Network Node implementation. Unfortunately, IBM doesn't allow licensing of APPN subsets.

A related problem arises for systems integrators, consultants, educators and manufacturers of protocol analyzers and test equipment, all of which need an APPN license to provide APPN-related services and products. The participation of such groups is critical to APPN's popularity and success. Yet IBM is cutting them off with its prohibitive cost and its determination to keep APPN proprietary except for license holders.

Third-party vendors can reverse-engineer APPN subsets, but IBM's aggressive talk of enforcing its patents is discouraging vendors from taking this approach. Clearly, IBM is within its rights to enforce its patents, but if it does so, it should stop characterizing its solutions as open. The fact is that IBM has never been open when it comes down to its crown jewels — mainframes, MVS, VTAM, the Network Control Program, NetView, Application System/400 and now APPN Network Node.

It was a different IBM at last month's APPN Developers' Conference — able to laugh at itself and wanting to do the right thing. Hopefully, this new IBM will strike the right balance between profits and users' need for open systems, and not let APPN go the way of its closed Micro Channel Architecture.

Kapoor is a principal of Kaptronix, Inc., a Haworth, N.J.-based consulting firm.

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EDITORIAL

Cisco's bold APPI plan may force IBM to open up APPN

We're of two minds about Cisco Systems, Inc.'s proposed alternative to IBM's Advanced Peer-to-Peer Networking (APPN). We applaud the leading router firm for proposing what could be a truly open approach to combining LAN and Systems Network Architecture traffic on multiprotocol networks — just how open it will actually be remains to be seen. But we wonder: Can Cisco pull it off?

Cisco's Advanced Peer-to-Peer Internetworking (APPI), like IBM's APPN, would enable users to route SNA traffic along with local-area net traffic. APPI will be developed by a consortium of vendors that will make specifications available to other vendors and users at no cost.

Cisco and some other vendors have criticized IBM for the high cost of licensing key APPN Network Node specifications and the fact that some vendors will get those sooner than others. (We've voiced similar concerns in a previous editorial.)

One analyst described Cisco's move as firing a warning shot across IBM's bow. Well, IBM is a mighty big ship with a lot of firepower, and it isn't at all clear that Cisco will be successful in slowing Big Blue's push to enshrine APPN as *the* method for building multiprotocol nets.

Cisco faces a tough technological challenge in realizing its APPI vision and winning support from its bitter rivals in the combative internetworking market. What's more, IBM has a big head start in developing APPN.

Still, Cisco's plan is intriguing. Most IBM users are, or will be, looking to interweave LAN and SNA traffic. It's troubling that the key method for merging those worlds — APPN — is controlled by a single vendor. Decisions about who gets certain APPN specifications, how much they will pay and how APPN will evolve will be IBM's. And that runs counter to open systems.

Cisco's motives in proposing APPI are simple: It doesn't want to be beholden to IBM in serving IBM users. But that doesn't diminish the value of its idea.

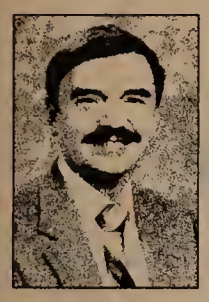
Other users and vendors that don't want to be indebted to a single vendor's vision of the future ought to look into the APPI plan now — if only to pressure IBM to really open up APPN.

OPINIONS

REALITY CHECK

BY THOMAS NOLLE

Advent of ATM will not doom routers, just redefine them



Anyone who believes that Asynchronous Transfer Mode (ATM) is the networking technology of the future believes in a future without routers, at least as we know them today.

This shouldn't come as a surprise. Every new technology offers users the promise of a new approach to an old problem. But every new technology also displaces an old technology, an aspect that isn't always appealing to network managers.

Many managers have made major investments in routers and are contemplating spending even more money on internetworking devices in the future. Although in the beginning, ATM and routers will coexist — in the form of ATM boards for routers, for example — ATM will eventually force network managers to write off their investments in this equipment.

In interconnected local-area networks, the function of the router is to read the addresses on messages passing from LAN to LAN and forward them to their ultimate destination. This is necessary because LAN protocols are connectionless.

To send a message, a device on a typical LAN inserts the address of the destination device into the message and broadcasts it. Each device on the LAN reads the address of each message and accepts only those addressed to it. The router, acting as a proxy for devices on other LANs, reads the addresses and intercepts messages designated for remote locations.

But ATM works differently. ATM isn't a LAN protocol; it's a *network* protocol. An ATM-based network is connection-oriented. A client that wants to talk to a server simply calls it.

This means ATM will support hierarchical, unique station addresses similar to telephone numbers. The ATM network of the future will link premises ATM switches and carrier ATM switches to create connections, just as the current phone system links private branch exchanges and central office switches.

Therefore, if ATM is to be successful, it has to be supported in carrier services and deliverable over premises networks to the desktop. It's logical to assume ATM's addressing and connection concepts will be applied through that range of connections, which would consign routers to the same future as Intel Corp. 8088-based personal computers.

> It's fair to say that router vendors won't simply lie down in front of the ATM bandwagon.
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This isn't to say that routers will disappear as soon as the first ATM adapter is installed on a LAN. Current LAN architectures can't migrate to ATM instantly without a level of investment that would send chills through any chief financial officer. There will be a period of router/ATM coexistence. But just like prey that wanders into a cougar encampment, the router's ultimate fate will be sealed when users begin planning to implement ATM to the desktop.

It's also fair to say that router vendors won't simply lie down in front of the ATM bandwagon. Routers will undergo an architectural change and begin to support hub-like features as they attempt to support ATM switching, which might generate some interesting turf wars between giants such as Cisco Systems, Inc. and Cabletron Systems, Inc. The hub, however, has a natural edge in the battle; an ATM switch is more like a smart hub than a router. Hubs already have gigabit backplanes; routers that switch even 40,000 packet/sec would have about as much capacity as a 16M bit/sec token-ring LAN in ATM mode.

Other sacred technology cows shouldn't feel safe either because ATM could change every aspect of data networking — from the application program interfaces to the carrier transmission systems. In the next three to five years, ATM will expand to encompass the majority of the over 20M bit/sec LAN market.

As it does so, it will help users build switch-based LANs. When those LANs are connected to wide-area services also based on ATM, they'll form the basis of the first really universal and virtual network.

Everyone seems committed to ATM — but only to its glamour. The fastest way to achieve ATM, if that is the goal of the marketplace, is to address the things ATM will force us to change. Dealing effectively with the investments that carriers, customer premises equipment vendors and end users have made in present networks is the only way to create a climate of growth. The objective is not to save the router or justify it for a longer period, but rather to map a credible evolution from it to a more flexible future.

Nolle is president of CIMI Corp., a technology assessment firm in Voorhees, N.J.

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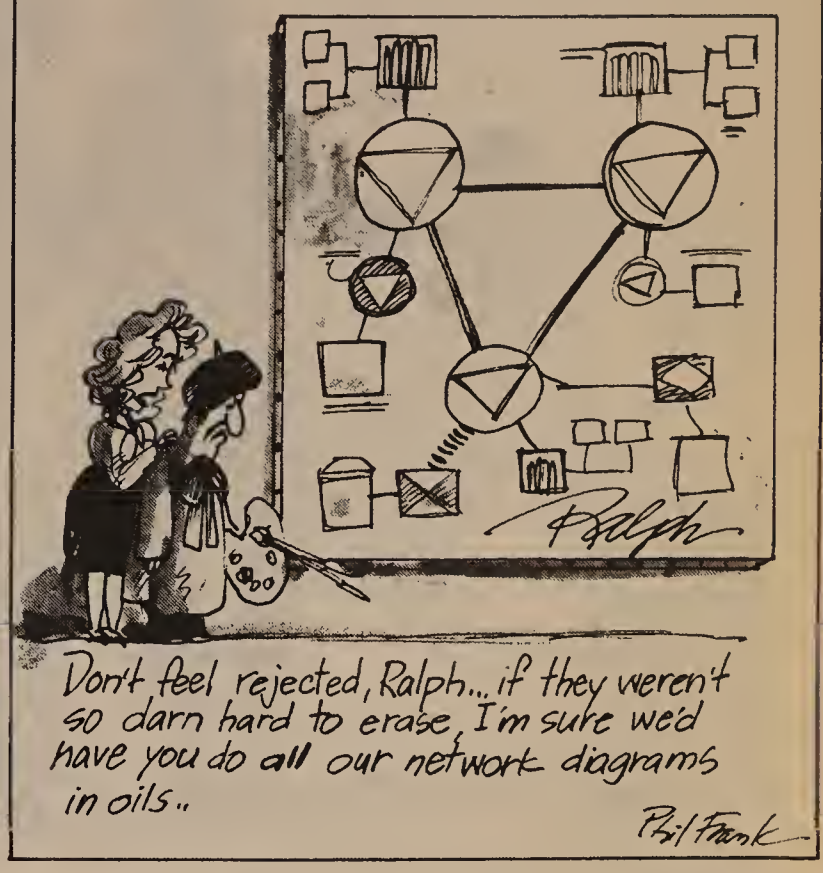
TELETOONS

BY FRANK AND TROISE



LETTERS

Minor differences

I would like to clarify points made in "HP test system checks for National ISDN 1 compliance" *(NW,* Aug. 3), which stated that the National Institute of Standards and Technology (NIST) rejected Bellcore's National ISDN 1 specification and is backing a different Integrated Services Digital Network standard.

The planned Federal Information Processing Standard (FIPS) for ISDN is based on voluntary industry standards approved by ANSI and on implementation agreements developed by the North American ISDN Users' Forum (NIUF). There are minor differences between the planned FIPS and the National ISDN 1 specification. However, they do not constitute a different version of ISDN.

We believe Bell Communications Research's development of the National ISDN 1 specification has greatly accelerated the deployment of ISDN in North America. NIST, NIUF and Bellcore are working together to assure complete alignment of future ISDN specifications.

David Su
Manager, Advanced
Communications Group
NIST
Gaithersburg, Md.

Editor's response: Debate over the term 'version' may be a matter of semantics here. NIST's federal ISDN purchasing specification differs from National ISDN 1 in such areas as error handling procedures and status inquiry messages, and will require vendors to undergo separate conformance testing. That has created concern among vendors of ISDN customer premises equipment.

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Designs make or break frame relay switches

Three frame relay switches prove they can move data, but performance peters out at different stages.

Engineers from AT&T Bell Laboratories, Telenex and W&G put frame relay switch through the paces.

Not all frame relay switches are created equal.

Switch performance and functionality varies widely due to architectural differences between products, according to the latest findings of a test conducted for *Network World* by AT&T Bell Laboratories and two leading test equipment vendors.

In the second round of *Network World's* Frame Relay Test Series, Ascom Timeplex, Inc.'s FrameServer proved to have the best throughput of the three switches tested.

However, test team members caution that while it's unfair to draw head-to-head comparisons among switches using different architectures, the results can be used as a benchmark for comparing performance against similarly architected switches made by other vendors.

Exactly what constitutes a frame relay switch is debatable. But for the purpose of these tests, the test team defined a frame relay switch as a device that accepts frame relay input on a single port and switches it among other ports, allowing any-to-any connectivity between ports. Multiplexers and packet switches can be outfitted as frame relay switches. In this test, routers — which provide a direct connection to a local-area network — were disallowed.

About 20 vendors were invited to participate in the test, but only three accepted the invitation. In addition to Ascom Timeplex, AT&T supplied its BNS-1000 and Telematics International, Inc. sent its 5601 Stacpac.

Vendors that declined did so citing scarce availability of their products, as many said they have only enough inventory to fill orders.

Measuring limits

The tests were designed to determine switch performance and transmission delay. The test team measured performance in terms of throughput, or how many frames per second a switch could handle before slowing down.

To determine how the three switches would respond to various network loads, the test team performed a battery of throughput tests. These tests stressed the switches with various frame sizes and rates in an effort to determine the points at which transmission levels began to degrade.

Performance tests were conducted in two scenarios: intranodal, in which frames were switched from one port to another on the same switch, and internodal, in which frames traveled between switches.

Transmission delay tests measured the time it took for the switches to receive and process frames. Here, too, the test team collected intranodal and internodal statistics.

To conduct the tests, switches were linked to Wandel & Goltermann Technologies, Inc. (W&G) and Telenex Corp. protocol analyzers, which generated traffic and gathered statistics (see "Factoring in the intangibles," page 60).

Intranodal results will be beneficial to users contemplating a frame relay net in which one switch acts as a hub to link sites within a limited area. Internodal results will be of interest to users with widespread networks in which regional sites are tied to a hub and hubs are connected via high-speed trunks.

Architecture differences

The tests found that even though all the switches successfully transmitted frames across the test network, they all experienced performance degradation at different stages due to their architecture designs.

In general, as traffic loads increased, the switches experienced a decrease in performance and an increase in the number of congestion notices a switch forwarded. Likewise, some switches took more time to transmit frames than others.

(continued on page 40)

By JIM BROWN and STAN FRY

PHOTOGRAPHY ©1992 MEL EVANS

(continued from page 39)

While all the devices were able to execute the basic set of tests, the vendors' approaches to frame relay switching were vastly different. Each switch had a distinct architecture.

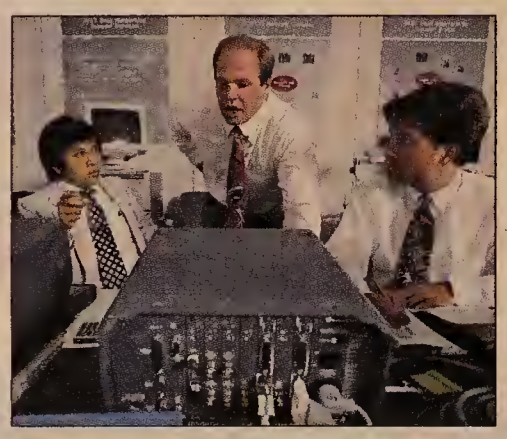
Telematics' 5601 Stacpac is essentially an X.25 packet switch that has been reengineered to support frame relay.

The switch was designed for the slower speeds and overhead associated with X.25 and its error handling features. While this scheme sacrifices some amount of processing time on frame relay networks, its advantage is that users can convert existing equipment to frame relay for the incremental cost of software.

"That's one of the beauties of frame relay," says Wayne Driver, product manager of wide-area network products at W&G. "Switch manufacturers just have to put some software on their product, and customers can continue to use it while the manufacturer develops another switch that handles frame relay better."

AT&T, by contrast, uses cell switching in its BNS-1000. The idea here is that the switch accepts frames from network devices and reorganizes them into fixed-length cells. The switch is then able to handle these cells more efficiently than with the variable-length frames created in frame relay networks. This scheme relies on the destination device to reformat the cells back into the frames' original form.

Ascom Timeplex's FrameServer is designed from the ground up to support frame relay. It takes advantage of the full range of flow control and other management features of frame relay, including its high speeds. For very high-speed networks, however, users would be better off using a cell-based switch.



The benefit of time-division multiplexing switches, such as those from AT&T and Ascom Timeplex, is that the units have more bandwidth control.

Throughput tests

The objective of the tests was to determine the maximum frame rate at which the switches could pass frames and the point at which the switches set the Forward Explicit Congestion Notification (FECN) bit.

The FECN bit is found in each frame's two-byte header. It's a warning signal for network devices to throttle back their traffic because a particular frame relay permanent virtual circuit is overloaded. Once the switch catches up with the traffic on the link, end devices can resume their normal traffic loads.

During the throughput tests, it quickly became evident that the FrameServer had an advantage.

The test team opted to send frames using three frame sizes: 64, 256 and 1,500 bytes. These frames were sent at progressively smaller idle times, resulting in frame rates that gradually approached the theoretical limit.

The test team selected the 64-byte size because that is the smallest size frame a router is likely to forward to a switch. Likewise, it opted for the 256-byte frame because it is the typical size used by Open Systems Interconnection-based protocols, and the team chose the 1,500-byte frame because it is the maximum size for an Ethernet packet.

"Different protocols use different frame sizes," Driver says. "This test will give users a good flavor for the forwarding rates for those different frame sizes."

For all tests, the committed information rate (CIR) was at or near frame relay's theoretical 2M bit/sec bandwidth rate and one Data Link Connection Identifier (DLCI) was monitored. DLCIs define a frame relay address.

The test team used only one DLCI in order to maintain consistency in test results. The CIR is the amount of bandwidth a carrier guarantees will be available to a user at all times. The user may be able to exceed the CIR if bandwidth is available, but the carrier is not supposed to provide bandwidth below the CIR.

"We're messing around with products we don't know, and we just wanted to keep the test as simple as possible," Driver says.

However, it is safe to say that performance will drop when multiple DLCIs are used. These tests do not address multiple users vying for bandwidth via DLCIs.

"Users will see a difference in performance when contending with multiple users and DLCIs on the same link," says Robert Moul, supervisor of the applications engineering group at AT&T Bell Laboratories in Warren, N.J.

Users should decrease the amount of CIR dedicated to DLCIs once their numbers start to increase, says Raul Sitavi, an applications engineer at W&G. The more DLCIs, the greater the likelihood that all will be transmitting at once and, therefore, putting undue burden on the carrier to maintain the CIR for each.

Of the three frame sizes, the 64-byte proved the most challenging for all three switches in the intranodal test scenario. This frame size creates many more frames for a typical transmission, and since each frame adds extra overhead to processing, it was not surprising that the products experienced difficulty.

The three switches performed at vastly different levels during this test. The test team expected each product to switch a certain amount of frames each second and then start dropping them when it became overloaded, which is normal for frame relay.

When frames are dropped, the transmission protocol used by the receiving node in a frame relay net requests the retransmission of missing frames. This has an effect on throughput since new frames cannot be sent until the missing ones have been retransmitted.

To further compound problems, for each batch of retransmitted frames, some will make it through while others will be dropped, thus forcing a third retransmission. This keeps happening until the switch can catch up with the number of frames being transmitted.

The Telematics switch handled 405 frame/sec with no problem. But it started dropping frames by the time it had to handle 584 frame/sec. In fact, only 543 frame/sec got through.

AT&T's BNS-1000 had no problem supporting 1,258 frame/sec. But it ran into problems by the time it was asked to switch at 1,680 frame/sec. In fact, it capped out at switching only 1,167 frame/sec.

Ascom Timeplex's switch, on the other hand, experienced no difficulty switching frames all the way up to 2,640 frame/sec.

At the point when throughput began to drop, the Telematics and AT&T switches set the FECN bit. In these tests, the number of frames with the FECN bit set quickly approached 100% for the Telematics and AT&T switches and remained there for the frame rates tested.

"The implication is that both devices realized they were encountering congestion and took steps to react to it," Moul says.

The test team was a bit surprised, though that throughput continued to decline once the FECN bit had been set. "Ideally, the congestion notification just comes up and you drop no frames," Driver said. "Everything should throttle back before you start dropping frames."

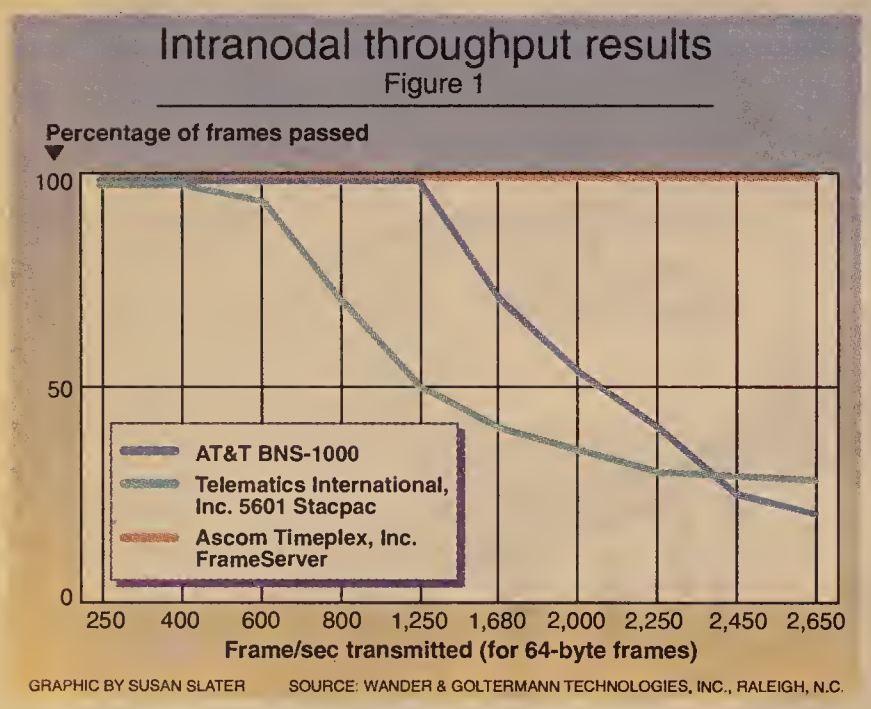
But that was not the case in these tests. "We were a little surprised by that," Sitavi says. "Our expectation was that the switches would set the FECN bit only and not lose frames. But throughput went down and the number of frames with the FECN bit set went up when we increased traffic."

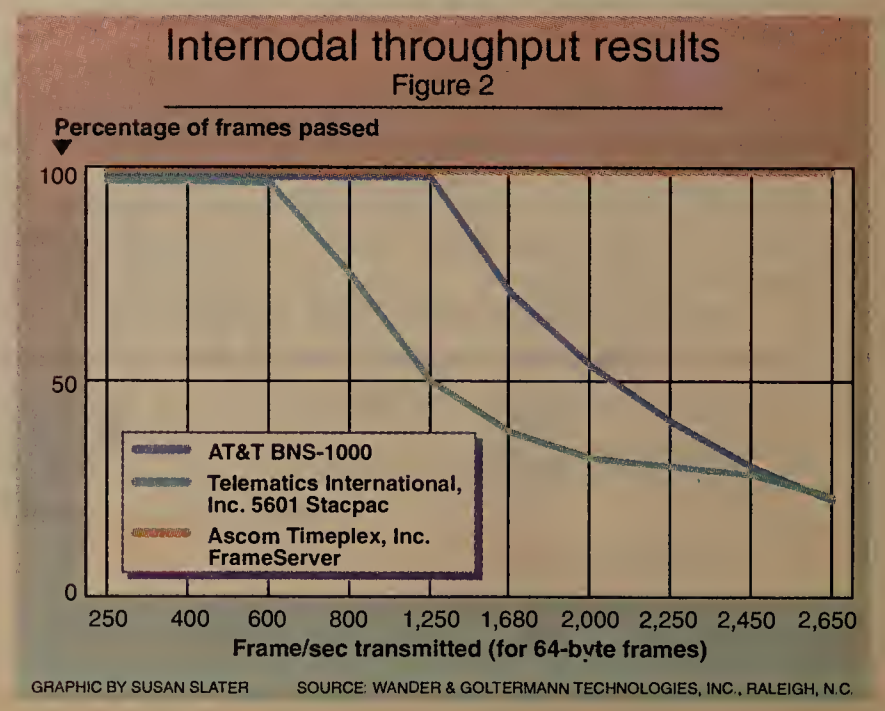
There was one exception. At 2,285 frame/sec, the number of frames for which the Telematics switch set the FECN bit began to drop slightly. This was because the switch was passing fewer frames (at a throughput of 26%). Subsequently, with a lower throughput, the switch was able to catch up as shown by the declining percentage of frames with the FECN bit set. "The switch was marking less frames with the FECN bit because it was dealing with a lower number of incoming frames," Sitavi says.

While the Ascom Timeplex and AT&T switches performed well for 256-byte sizes, the Telematics switch began dropping frames at 546 frame/sec. With less overhead at this frame size, the Telematics device did, however, maintain throughput at approximately 80%.

"What that means is anyone using this switch should probably watch utilization rates carefully to make sure performance

(continued on page 60)





The benefit of time-division multiplexing is that the units have more bandwidth control.

▲▲▲

LAN IMAGING SYSTEMS

Imaging undergoes a metamorphosis

As vendors embrace standards, the evaluation of LAN imaging systems boils down to a few major factors.

By MIKE ALSUP

Until recently, anyone interested in harvesting the benefits of imaging had few choices. For years, imaging vendors offered only expensive, proprietary imaging systems that locked users into a single hardware and software operating environment.

Now, however, that picture is changing. Users have sent a clear message that they want to store images using the same database management system and storage devices currently in place, as well as view images on standard client workstations.

Imaging vendors are responding by adapting their offerings to work with a broader range of third-party hardware and software.

In fact, most of today's local-area network imaging systems come with interfaces that enable imaging software to accept images from a variety of vendors' scanners or facsimile machines, store them on popular magnetic and optical disk drives, as well as ship them to printers made by a wide variety of vendors. Likewise, imaging vendors are providing software tools that enable users to add imaging support to existing client/server environments.

For instance, users can now purchase software that can add imaging services to existing SQL DBMSs running on a server and to front-end client applications running under Microsoft Corp.'s Windows 3.1. And increasingly, client-based imaging applications can communicate with image servers over popular LAN operating systems such as Novell, Inc.'s NetWare.

Many of the well-established imaging vendors that were once proprietary, such as FileNet Corp. and Wang Laboratories, Inc., have taken dramatic steps to open up their imaging systems. FileNet has ported its software from its proprietary Unix-based hardware platform to IBM's RISC System/6000. Wang has also ported its Wang Integrated Image System from Wang hardware to the RS/6000 and developed its Open/Image products to run on NetWare LANs without requiring any Wang hardware.

However, this rapid evolution of the document imaging market has left many users confused about how to separate hype from reality as they evaluate LAN imaging systems.

At the high end of the market, such vendors as Digital Equipment Corp., FileNet, Hewlett-

(continued on page 42)

LAN imaging systems

Company	Product	Client OS					Memory (M bytes)	Windows 3.1 support	DDE support	Server OS					NOS support	NetWare support	Database support	Max. no. of fields	Other features					Image format	Pricing basis	Avg. installation cost/no. of users
		DOS	Macintosh	OS/2	Unix	Other		C = Current P = Planned	C = Client S = Server NA = Not applicable	DOS	NetWare	OS/2	Unix	Other	P = All via Pathworks L = LAN Manager N = NetWare S = LAN Server V = VINES A = AppleTalk	NB = NETBIOS T = TCP/IP stacks I = IPX/SPX N = NLM	P = Proprietary S = Sybase OT = Other G = Gupta I = IBM IN = Informix O = Oracle	U = Unlimited	Work flow	Print highlighting	Third-party tools	OCR	COLD	T = Tiff O = Other J = JPEG P = PCX	C = Concurrent P = Per client	
Combined Computer Resources, Inc. (214) 432-2360	WinOcular Imaging Information System	✔					8	C	C, S		✔				L, N, V	N, NB	G	U	✔		✔	✔	✔	J, T	P	$80,000/5 users
Compulink Management Center, Inc. (310) 212-5465	LaserFiche LAN	✔					2	P	NA	✔	✔				L, N, V	I, NB	OT	12	✔		✔	✔	✔	T, O	C	$15,000-$25,000/1-5 users
Digital Equipment Corp. (603) 884-0360	DECimage Express	✔				✔	8	C	S					✔	P	I, NB	OT	5	✔			✔		T, O	C	$15,000/25-30 users (3)
FileNet Corp. (714) 966-3400	WorkFlo Business System	✔			✔		4	C	C, S				✔		L, N, V	I, T	O	250	✔	✔	✔	✔	✔	T, O	P	$600,000/64 users
Hewlett-Packard Co. (800) 637-7740	HP Advanced Image Managment System	✔					8	C	C, S				✔		L, N, V	T	IN (2)	32,000	✔	✔	✔	✔	✔	T	P	$450,000/30 users
IdentiTech, Inc. (407) 951-9503	FYI	✔		✔			4	C	C, S	✔		✔			L, N, V	NB	P	36		✔	✔	✔	✔	T	C	$17,500/5 users (3)
Image Business Systems Corp. (212) 696-2500	ImageSystem	✔					4	C	C, S				✔		L, N, V	T	S (2)	16				✔	✔	T	P	$100,000-$150,000/ 8 users; $2,500/ additional user
IMAGEngineering (614) 899-7226	Paper Terminator	✔					8	C	C, S				✔		V	T	O	U	✔	✔	✔	✔	✔	P, T, O	C	$5,000-$9,000/user
Imara Research Corp. (416) 581-1740	Imara 2.2	✔	✔	✔			6	C	NA	✔		✔			L, N, S	NB	I, IN, O, S	U	✔	✔	✔			P, T	C	$9,500/5 users (3)
Keyfile Corp. (603) 883-3800	Keyfile	✔					4	C	C, S	✔					L, N, S, V	NB	P	U	✔	✔	✔	✔		P, O	P	$15,000/10 users (3)
Lanier Worldwide, Inc. (800) 852-2679	Lanier Information Management System	✔		✔	✔		4	C	NA	✔		✔	✔		L, N, V	I, NB	P	9		✔	✔	✔	✔	P, T	C	$5,000/user
LaserData, Inc. (508) 649-4600	LaserView	✔					6	C	S	✔	✔				L, N, V	N, NB	O, S, OT	U	✔	✔	✔	✔	✔	T, O	C	$125,000/15 users
Micro Dynamics, Ltd. (301) 589-6300	MARS	✔	✔				6	C	C, S	✔			✔	✔	A, L, N	T	P	150	✔	✔	✔	✔	✔	J, T, O	C	$70,000/15 users
Optika Imaging Systems, Inc. (805) 520-9060	FilePower	✔					2	C	NA	✔					L, N, V	NB	P	4	✔		✔	✔	✔	P, T	C, P	$7,500/1 user; $150,000/ unlimited users (3)
Plexus Software, Inc. (408) 743-4300	ImageFlow	✔					4	P	C, S				✔		L, N, V	T	IN (2)	32,000	✔	✔	✔	✔		T	C, P	$300,000-$700,000/ 40-100 users
Sigma Imaging Systems, Inc. (212) 476-3000	OmniDesk	✔		✔			8	C	C, S			✔			L, N, V	NB	I	U	✔		✔	✔		T, O	P	$15,000/user
SoftSolutions Technology Corp. (801) 226-6000	Image Manager	✔			✔		4	P	C, S (1)	✔			✔		L, N, V	NB	P	46				✔		P, T	P	$45,000/100 users (3)
TEAMWorks Technologies, Inc. (508) 460-0053	Frequent Filer	✔					4	C	NA	✔					L, N, V	I, N, NB	G, O, S	50	✔		✔		✔	O	C, P	$9,500/10 users (3)
ViewStar Corp. (510) 652-7827	ViewStar 3.0	✔					8	C	C, S	✔		✔			L, N, V	NB	G, S	U	✔	✔	✔	✔	✔	T	C, P	$325,000/50 users
Wang Laboratories, Inc. (508) 459-5000	Open/Image	✔				✔	8	C	C, S	✔	✔		✔		L, N, V	N, NB	OT	U	✔		✔	✔		T, O	P	$58,750/20 users
Westbrook Technologies, Inc. (800) 949-3453	Imagic	✔					8	C	NA	✔					L, N, V	I, NB	P	21				✔		P, T, O	C	$1,895/15 users (3)
Winthrop Stewart Associates, Inc. (617) 331-8325	KwicFile/ KwicImage	✔			✔		4	C	C, S	✔					L, N, V	NB	P	Varies	✔	✔	✔	✔	✔	T, O	C	$15,000-$35,000/10-75 users

(1) For document management only.
(2) Modified database.
(3) Pricing is for software only.

COLD = Computer output to laser disk
DDE = Dynamic Data Exchange
IPX/SPX = Internetwork Packet Exchange/Sequenced Packet Exchange
JPEG = Joint Photographic Expert Group standard
NLM = NetWare Loadable Module
NOS = Network operating system
OCR = Optical character recognition
OS = Operating system
PCX = PC graphics format
TIFF = Tagged Image File Format

SOURCE: BUSINESS SYSTEMS GROUP, INC., HOUSTON

(continued from page 41)
Packard Co., IBM, LaserData, Inc., Plexus Software, Inc., ViewStar Corp. and Wang offer products built around high-end DBMSs that can support hundreds of users and the development of sophisticated applications. These firms also provide training services and assistance in integrating their products into the user's environment.

In addition, high-end systems come with development tools that enable users to integrate imaging capabilities into existing applications or develop new imaging applications.

Many high-end imaging systems are able to utilize valuable features that are inherent in the system's individual components, such as archival and backup support found in the DBMS and massive amounts of storage available on optical jukeboxes.

High-end imaging systems are suited for applications in which a large number of documents must be processed as images, and data from images must be made available to various host-based applications as well as routed among many users in an established work flow. For instance, a high-end imaging system can help speed the entry of data from invoices into a host-based accounts payable application.

Incoming invoices are scanned and images are sorted into different queues, each of which could correspond to the type of product or service purchased. Data entry clerks then view invoices in a workstation window, examine certain fields and enter data into the host application from within another window. Thereafter, workers accessing data from the accounts payable application to see whether the bill has been paid will also be able to view an image of the actual invoice.

At the low end of the market, vendors such as Westbrook Technologies, Inc. sell imaging systems as shrink-wrapped software that users can install.

Typically, low-end systems are designed to support simple applications such as creating electronic file cabinets for storing and retrieving documents, including letters, contracts and manuals.

Buyers' guidance

Whether at the high or low end, many imaging system features are consistent between vendors. Products generally support Windows 3.1-based clients, NetWare, Microsoft's LAN Manager and Banyan Systems, Inc.'s VINES. Most also support optical character recognition devices that enable users to convert an image into an ASCII file, facsimi-

le machines, and the same brands of scanners, printers, optical disks and jukeboxes.

While imaging systems support popular LANs so the services can be layered on top of the network operating system, no LAN operating system today provides built-in imaging capabilities. But that is about to change. Eastman Kodak Co. is working with Novell to embed imaging services within NetWare (see "Kodak forms partnerships," this page).

This alliance has several important dimensions. First, NetWare 4.0 will provide device drivers that let it support optical storage devices and other imaging peripherals that can be controlled by the net administrator.

The transfer of responsibility for incorporating device drivers from the imaging vendor to the network administrator addresses one of the primary impediments to progress in the imaging industry: It took the small imaging vendors too long to do it on their

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Kodak forms partnerships

Some of the most interesting recent developments in LAN imaging involve partnerships that Eastman Kodak Co. has formed with other companies.

The firm is working with Lotus Development Corp. to add its Document Image Management System (DIMS) software to Lotus Notes. DIMS makes it possible for documents created in Lotus Notes to be stored as images.

Eastman Kodak also worked with IBM to codevelop IBM's ImagePlus/2, an OS/2-based imaging system with a variety of powerful capabilities. The product enables users to scan images into a Personal System/2 server and give LAN-attached workstations access to those images.

But perhaps Eastman Kodak's most far-reaching partnership is the one it has with Novell, Inc. to create Image Enabled NetWare software, which will enhance NetWare's ability to support imaging applications. The result of this collaboration will be system-level services and application program interfaces (API) implemented as NetWare Loadable Modules (NLM) that allow developers to provide NetWare 4.0 users with enterprisewide imaging capabilities from their workstations, whether they are running Microsoft Corp. Windows, OS/2 or Macintosh applications.

While not an imaging system itself, Image Enabled NetWare will offer many tools and features that vendors and integrators will be able to tap when building imaging applications for NetWare environments. These tools and features will be delivered in phases through 1993.

Image Enabled NetWare will consist of four major components: High Capacity Storage Services (HCSS), Document Management Services (DMS), Image Management Services (IMS) and APIs.

HCSS will provide applications with access to virtually unlimited storage by integrating devices such as optical jukeboxes or other removable media devices through the standard NetWare file system.

DMS will enable workstation users to locate and access images using object-oriented technology that displays icons depicting folders, documents and workbaskets on workstation screens.

Complex documents consisting of many files and different data types can logically be associated and treated as a single object. Furthermore, related documents can be grouped together and placed in specific folders, assisting in the work flow throughout an organization.

DMS functions

DMS will consist of index card, document, folder and mass storage functions.

Index card functions will enable users to attach electronic index cards to documents and folders to facilitate searching and retrieval of selected items.

Document functions will enable users to create, maintain and delete documents. Documents are several related files grouped together, managed and processed as a single object.

Folder functions will enable users to create, maintain and use folders. A folder is a logical collection of documents or other folders.

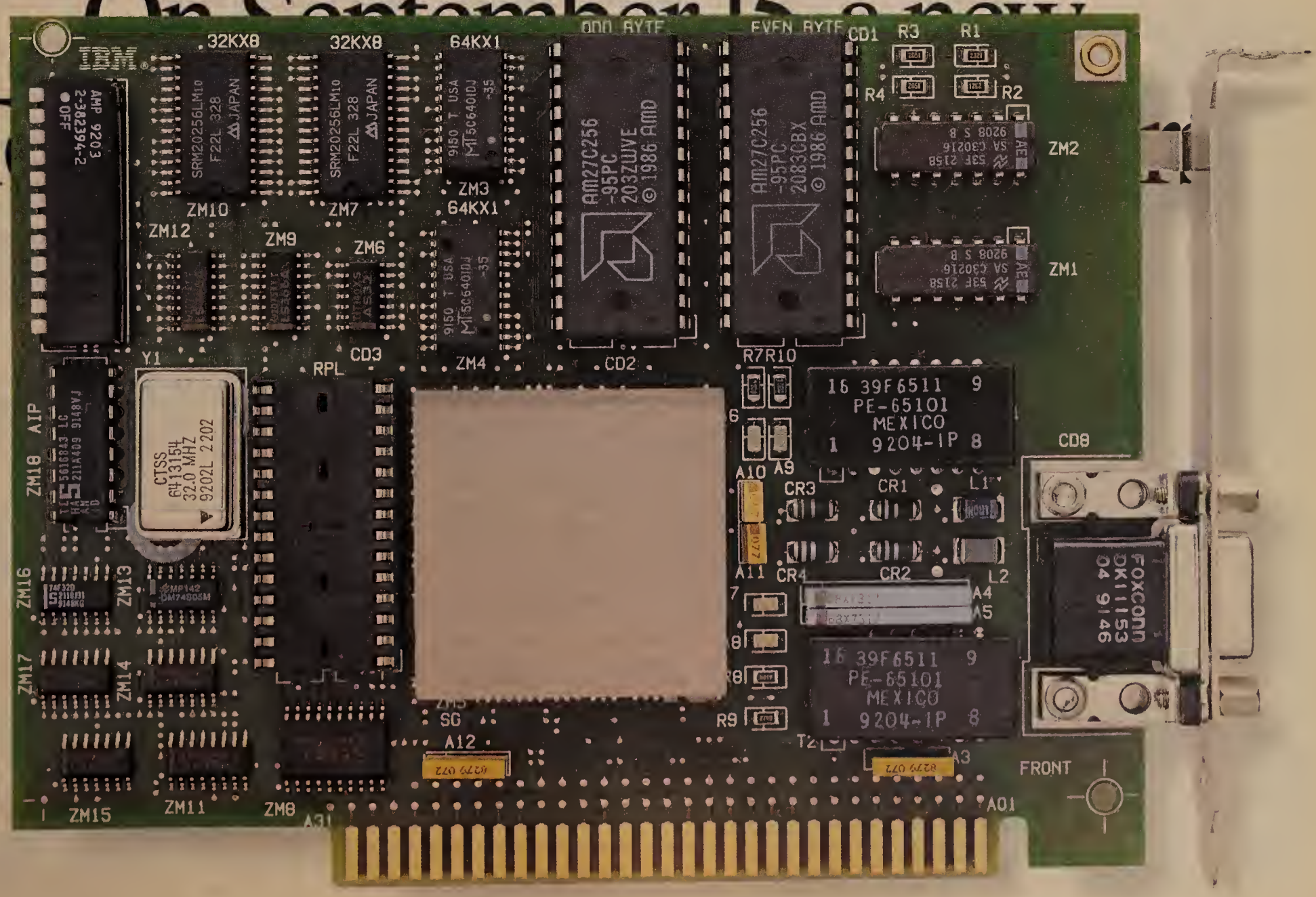
Mass storage functions will provide a distributed hierarchical storage management strategy that, when combined with HCSS, establishes an enormous repository for images and other data types.

Mass storage services also include a storage management infrastructure that automatically migrates large objects, such as documents and folders, from short-term magnetic storage to long-term optical media based on such criteria as date created or last time viewed.

IMS will complement desktop applications by providing facilities to create, maintain and access files containing images. Because these files may be any of several industry-standard file formats, including Tagged Image File Format and CCITT, an interpreter will load dynamically to allow access to the image.

Finally, Novell will provide documented APIs and client libraries that will allow developers to incorporate imaging and document management services into their applications.

— Mike Alsup



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own. Second, within 12 to 18 months, NetWare will have its own document management service that provides users with an object-oriented working environment. This will enable smaller imaging vendors to duplicate the sophisticated features of powerful imaging systems much less expensively.

Noticing the differences

There are some key differentiating features between the products, including varying levels of database support as well as the availability of third-party application development tools and support for Windows' Dynamic Data Exchange (DDE), that enable users to build powerful front-end applications running on clients.

Imaging vendors also offer varying levels of support for work flow software, which enables the development of applications that route images among workers according to an established pattern.

When imaging systems required dedicated hardware and software, the ability to truly integrate imaging into business applications was limited because users had to create a separate image database.

Back then, imaging vendors such as FileNet and Plexus built their products around modified versions of readily available DBMSs made by such vendors as Oracle Corp. and Informix Software, Inc. These modified DBMSs were used to create dedicated image databases and contained routines that provided the performance needed to run imaging applications.

Then IBM began preaching about the need to treat images as just another type of data that can be mixed with text, numbers and other forms of data in the same DBMS. Today, database technologies are being delivered to do just that.

The leading SQL database vendors, such as Sybase, Inc., Oracle, and Informix, have all added support for Binary Large Object (BLOB) fields to their DBMSs, thus breaking down user dependence on imaging system vendors to provide image databases.

BLOBs make it possible for users to store images in the same database used to support other applications such as accounts payable. They also make it possible for developers to build imaging applications using the same tools they employ to build database applications, instead of relying on tools supplied by the imaging vendor.

Wary of BLOBs

While support for BLOBs holds promise, few users are actually using them because of the performance drawbacks associated with running imaging applications on databases that are not optimized for imaging.

Users unwilling to risk performance degradation by using BLOBs will benefit by the move imaging vendors such as FileNet and Plexus have made away from using modified versions of SQL databases. FileNet has layered imaging support on top of Oracle, while Plexus has done the same with Informix, which means users can develop imaging applications with Oracle and Informix tools.

The DBMSs supplied by imaging vendors have a few advantages over those that use BLOBs. For instance, they are designed for peak performance and provide extensive facilities for backing up stored images. The DBMS vendors are working to improve the performance and backup capabilities their databases can offer when supporting images in an effort to lessen the need for database extensions developed by imaging vendors.

Whether provided by the DBMS vendor or the imaging vendor, the DBMSs in high-end systems enable users to create large numbers of index fields for each image. These index fields can be organized in a complex data model and help users identify images by key words or content so that they can be easily retrieved later.

Low-end systems such as Westbrook Technologies' Imagic offer proprietary databases that utilize proprietary and third-party development tools. Often, these proprietary databases are designed to support the specific application the low-end system vendor provides. They also limit the number of indexing fields that can be used for each document image.

Imaging system users can combine databases with third-party development tools and Windows' DDE capability to build powerful front-end applications running on client workstations. Many imaging system vendors, for instance, support Microsoft's Visual Basic and Powersoft Corp.'s PowerBuilder, which enable developers to retool client/server applications so users can access and view images.

With these third-party tools, developers can build powerful client/server applications using SQL DBMSs and Windows. The applications generate the calls needed to store and retrieve images and data from other databases as well as exchange information between applications using DDE.

The advantage that third-party tools have over tools supplied by imaging vendors is that they are more widely used in the Windows 3.1 environment because they support development of more than just imaging applications. This means there are more developers that understand how to use third-party tools and that the broad acceptance of these tools has driven their makers to add capabilities much more rapidly than imaging system vendors.

As a complement to supporting third-party tools, many imaging vendors support DDE, which enables end users to transparently copy data from one application into another. LAN imaging systems support two forms of DDE.

One is a DDE client capable of requesting data from another application running on the same workstation or on another network device.

The other DDE option is to set up a DDE server capable of re-

Types of imaging systems

Figure 1

Application	Typical use	Benefit
Archival	Enables users to output large quantities of documents to image-based storage and retrieval systems	Replaces microfilm and computer output microfiche systems
File cabinet	Enables users to scan and index frequently retrieved documents	Replaces file cabinets
Knowledge worker	Enables users to store information of all types in image files and retrieve that information using a variety of indexes	Replaces simple file cabinet systems with more extensive support for folders, tabs, retrieval options and user navigation of the file's contents
Customer service	Makes images of customer documents, such as purchase orders and invoices, available to a customer service representative while the customer is on the phone	Enables service representatives to view documents for such items as signatures and ordering or billing information
Case management	Enables users to continuously add information, including accident photos and patient charts and graphs to a case file, such as those used in law and medicine	Enables insurance firms to view damage claims and medical professionals to view patient records
Transaction processing	Supports data entry that is integrated with host-based transaction processing systems	Enables entry clerks to view document images and key information into host databases
Item processing	Enables users to process massive amounts of paper-based transaction records more quickly using specialized peripherals and software	Lets banks scan and process checks and credit card receipts
Engineering drawing	Provides support for viewing and red-lining engineering drawings and associated peripherals	Lets engineers view and comment on diagrams on screen
Geographic information system	Enables users to store and retrieve maps as images using a variety of indexes	Obviates the need to store and refer to large maps, such as those often used by public works departments

SOURCE: BSG CONSULTING, INC., HOUSTON

Judging imaging systems

The first step in evaluating LAN imaging systems is to recognize that there are many different types and they come in many shapes and sizes.

One approach to categorizing imaging systems is based on the applications that they are used to support. Several types of imaging systems are identified in Figure 1 on this page.

There are local-area network imaging systems on the market today capable of supporting the requirements of each of those applications.

However, LAN imaging systems are frequently very expensive to build and operate. Therefore, organizations such as banks, insurance companies and hospitals that have significant costs in handling paper documents are the likely strong candidates for imaging.

While the number of documents is important, it is not the only factor that will determine if a business needs a LAN imaging system. Many of the best LAN imaging system applications are in organizations in which business processes depend on prompt and accurate handling of the paper-based work flow. Users who can answer yes to one or more of the questions in Figure 2 on this page are good candidates for a LAN imaging system.

After concluding that a LAN imaging system is indeed appropriate for their business, users must make some important decisions including making a determination about the size of the LAN imaging system.

Here, too, there are some guidelines users can follow. Determining how many images need to be stored and how rapidly new images will added is key. Then users must figure out how many people will need access to these image and how often these images will be retrieved.

Other key factors include determining where end users will be located and how much customization will be required to make the LAN imaging system satisfy business requirements. Lastly, users need to figure out how much integration they will require between the LAN imaging system and current computer equipment and applications.

— Mike Alsup

Qualifying imaging applications

Figure 2

1. Is imaging a necessity?	In some applications, a document image is required in order to view information that cannot be portrayed well as computer-generated text. Examples include documents with notes in the margin, drawings or signatures.
2. Is the value of each document high?	Sometimes paper documents are not frequently retrieved but each document is valuable enough that an imaging system could be used to archive them. Examples include loan documentation or trading tickets at a brokerage.
3. Is file contention an issue?	Sometimes multiple users need to work with the same documents simultaneously. Examples include medical records, litigation support documents and statutory filings at regulatory agencies. Imaging enables more than 1 person to view the document without making copies.
4. Does the document work flow involve complex routing?	Imaging systems include facilities that make it easy for organizations to route documents among multiple decision makers. Examples include accounts payable and loan origination.
5. Can imaging significantly improve customer service?	In some organizations, it is very important to retrieve documents while customers are on the phone. The ability to retrieve a stored image over a LAN saves manual paper-tracking inquiries as well as telephone costs incurred while service agents wait for the paper to arrive, thus significantly improving service levels.
6. Are there high paper volumes or retrieval rates?	Very high volumes or retrieval rates of documents could indicate that an imaging requirement exists.
7. Would an imaging system fit into your environment?	Most users choose imaging systems that can be integrated with existing hardware and software, such as workstations, servers and databases. Users recognize they'll need specialized peripherals, such as scanners, printers and optical juke boxes, but also know these devices are shared among users.

SOURCE: BSG CONSULTING, INC., HOUSTON

sponding to a client request by providing or retrieving information. The vast majority of imaging system vendors offer DDE support, and almost all of the ones supporting DDE claim support for both client and server capabilities.

These capabilities are important in many imaging systems if users wish to integrate imaging features with other applications. For example, many organizations use DDE to transfer data from images to IBM mainframe-based applications.

In such an environment, an image such as a purchase order is displayed in one window on a workstation, while a 3270 order entry session can run in another. The end user could view the image and key in information from certain fields to create an index that is kept with the image. That index data can be copied to the 3270 application using DDE so that the data is only entered once.

Work flow support

Another differentiating factor among imaging systems is their level of support for work flow software. Imaging vendors, especially FileNet, Sigma Imaging Systems, Inc. and ViewStar, have contributed to the growth and understanding of work flow systems by including the capability in their products. The software enables users to build routines that route images from staff member to staff member as each completes their work.

Recently, however, companies such as Action Technologies, Inc. and Reach Software Corp. have ushered in a new category of work flow tools. These tools are extensions to electronic mail systems and operate independently of the applications that they work flow-enable. They act as a simple transport mechanism for routing images along with E-mail messages and other documents among users.

Many users see work flow as a natural extension of their existing E-mail systems. This has proven to be an attractive approach, and these companies have experienced rapid growth.

Work flow is a diverse application area, however, and a variety of tools support specific applications. Some work flow tools, such as E-mail extensions, perform well in diverse user groups and applications. Some applications make more intense demands on system resources and require more customized and integrated work flow solutions, such as those provided by imaging system vendors.

There are two important differentiating features in work flow. Does the imaging system provide tools that allow users to easily define work flows without having to be a software programmer? Some firms such as Plexus and Sigma Imaging Systems provide graphical user interfaces that enable users to build links between on-screen icons to define the chain of events that images go through.

For example, users can draw a link from their workstation to a supervisor's workstation and one from the supervisor's workstation to a printer. When the user is done with the image, it is fowarded to the supervisor for review. Once the supervisor is finished, the image is routed to a printer.

Secondly, there are work flow applications implemented through tools that the imaging vendor provides or through E-mail-based tools provided by a third party. The E-mail tools that can be integrated with LAN-based imaging systems are fairly new but are rapidly growing in capabilities and popularity.

Some users see the benefits of work flow software. "We're seeing several work flow applications," says Barbara Woodland, specialist in Pennzoil Co.'s Information Systems organization in Houston. "We believe that we want one enterprisewide work flow system, but we're not sure if we want to use our imaging tool or an E-mail based tool to support work flow."

The development of database, front-end and work flow tools begs the question of what is the future of the imaging vendors in the new client/server world? Only those vendors that take advantage of advances in databases and LAN operating systems will be competitive in providing users better tools for development, document management and work flow.

Other factors

Aside from examining the major differentiators among products, some users will have requirements for a handful of other important features.

For example, basic document scanning capabilities can be augmented with support for a variety of batch scanning and bar coding controls. These features reduce the user effort for scanning and indexing images, and are found predominantly in high-end systems.

Another key factor to consider is the image file formats a system supports. Most products support the Tagged Image File Format. Some LAN imaging systems, including those from IMAGEngineering, Imara Research Corp., Keyfile Corp., Lanier Worldwide, Inc., Optika Imaging Systems, Inc., SoftSolutions Technology Corp. and Westbrook Technologies, support personal computer standards such as the graphics format PCX, and others, including those from Combined Computer Resources, Inc. and Micro Dynamics, Ltd., support color compression standards.

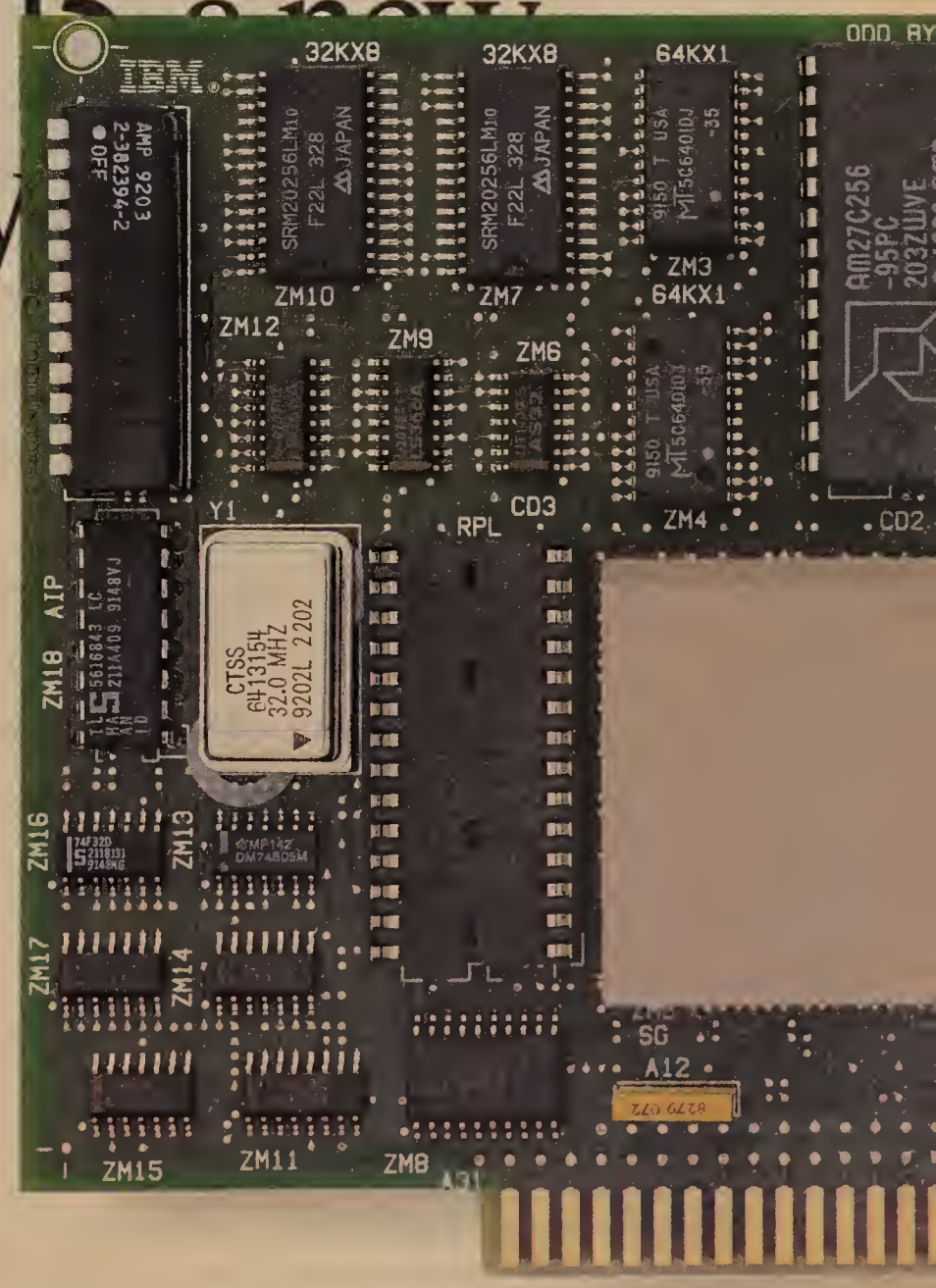
Another important feature is support for computer output to laser disk (COLD). This enables mainframe-produced reports to be stored in the image database in ASCII format and provides an alternative to computer output to microfilm products, which are used to create microfilm copies of computer reports. It also provides an important advantage in that the data is available for searches based on particular phrases or values.

More than half of the products in the Buyer's Guide chart on page 42 support COLD.

Support for an interface to an

(continued on page 47)

On September 15 a new Token Ring family will enter the



The world's fastest dial modem can really make information fly.

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(continued from page 45)
optical character recognition (OCR) tool made by such vendors as Calera Recognition Systems, Inc. enables users to create an ASCII file from a stored image. This can be particularly important to users who are interested in creating full-text indexes to their documents. All vendors except Imara and TEAMWorks Technologies, Inc. indicate they can support OCR integration with their imaging systems.

Because many users need to change document images and print the modified documents, some vendors enable users to print image highlights and changes. This is particularly important if portions of the documents are confidential, such as signatures or medical data, and cannot be printed. About half the products listed in the chart offer this capability.

Pricing

While vendors are working to provide basic and advanced features, the primary challenge they face is pricing their products. In the past, proprietary imaging applications typically cost more than $25,000 per user, including networking, hardware, software and applications development. Vendors justified those costs by the advantages in their proprietary databases, networking, development tools, back-end services and supported devices.

These advantages are being systematically eliminated as imaging vendors embrace a wider range of readily available hardware and software. By adding imaging support to existing DBMSs and enabling users to supply their own scanners, printers and image workstations, vendors have dropped the cost of imaging to less than $10,000 per seat for some large applications.

> Imaging has dropped to less than $10,000 per seat.
>
> ▲▲▲

The pricing of the imaging system can be based on the number of workstations on which the software will run or on a concurrent licensing basis in which the server limits the number of clients that can be active at any given time. There is a trend toward concurrent licenses, which reduces the total cost of imaging applications in which a large number of users have an occasional need to view an image. More than half the products in the accompanying chart offer either concurrent licenses or a choice of concurrent or per-client pricing.

By looking at the column containing the average installation cost and number of users, customers can get an indication of whether a particular system is best suited for large or small applications. This pricing figure includes the costs of adding imaging software and peripherals to an existing network but does not include the costs of the workstations or the network itself. It also includes some integration costs associated with larger systems. Smaller systems offer fewer options for integration and, thus, have lower integration costs.

Vendors estimated the cost of a typical installation based on the average number of users their system supports. For instance, Combined Computer Resources quoted an average price of $80,000 for five users, which is the typical number of users it supports. Plexus says the average cost for one of its typical systems supporting 40 to 100 users is between $300,000 and $700,000.

Other vendors, such as Lanier, estimated the price of their products on a per-user basis. As the number of users increases, the cost per user typically declines.

Powerful imaging systems are available to users and developers who understand their capabilities. Managers who have taken the time to select appropriate applications and establish realistic expectations will be rewarded.

Everyone who is evaluating imaging systems should have the objective of celebrating their choice instead of being forced to undergo a migration to more modern tools in two or three years.

Alsup is a senior manager with BSG Consulting, Inc. in Houston.

Stock takes heavy beating

continued from page 29

Both Douglas, and another analyst, Ajit Kapoor, vice-president and director for image processing at Westport, Conn.-based META Group, said the videoconferencing market still appears strong, even in face of the recession.

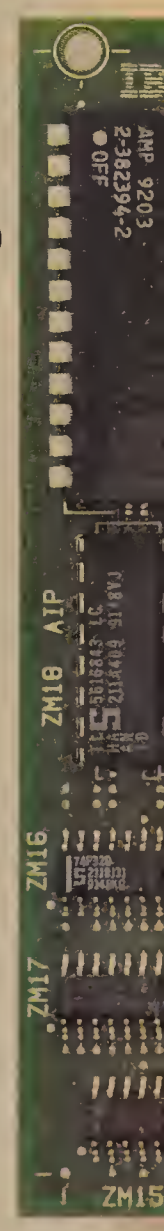
But PictureTel asserted that buyers are taking longer to make purchasing decisions on videoconferencing systems because of the need to evaluate the growing competition in the field and new technologies such as personal computer-based video.

CLI, which has undertaken a wider diversification strategy than PictureTel, plans to ship Cameo, the first low-priced add-on integrated system for the Macintosh computer that brings videoconferencing capability to the desktop.

As part of its diversification effort, CLI this spring introduced the SpectrumSaver, the first digital decoder for satellite-based business television communications.

In recent weeks, the stock at CLI and PictureTel has been slowly inching up. Kapoor pointed out that difficulties any company faces in one quarter may shake Wall Street, but videoconferencing users should not become alarmed until successive losses cloud a firm's chances for survival.

On September 15, a new Token Ring family of adapters will enter the picture.



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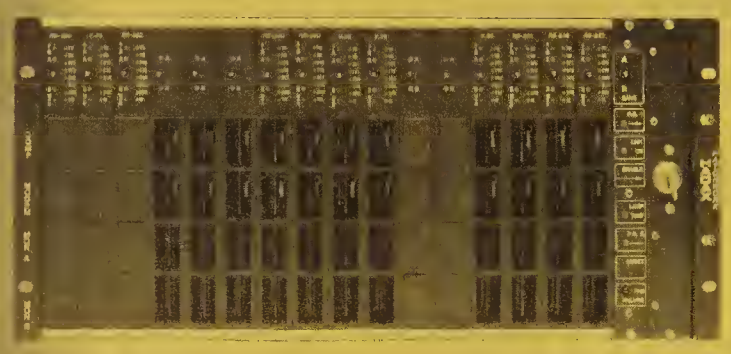

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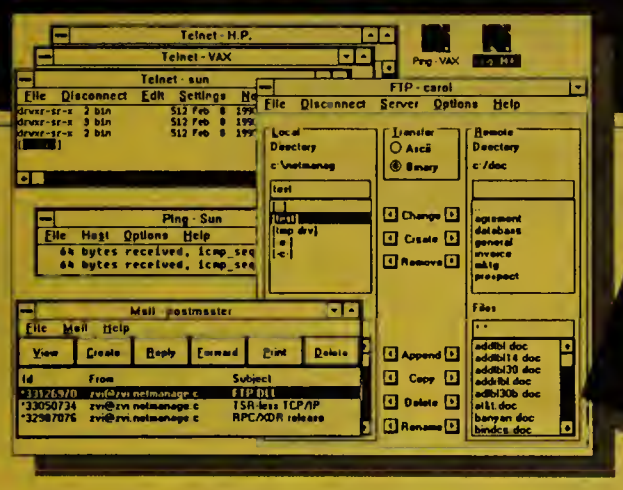

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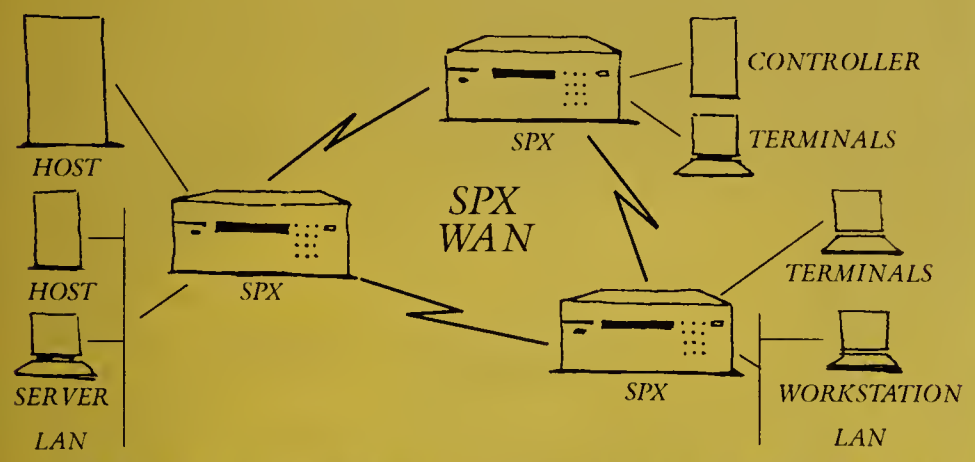

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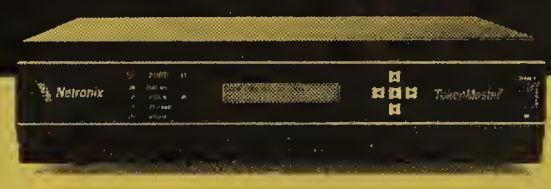

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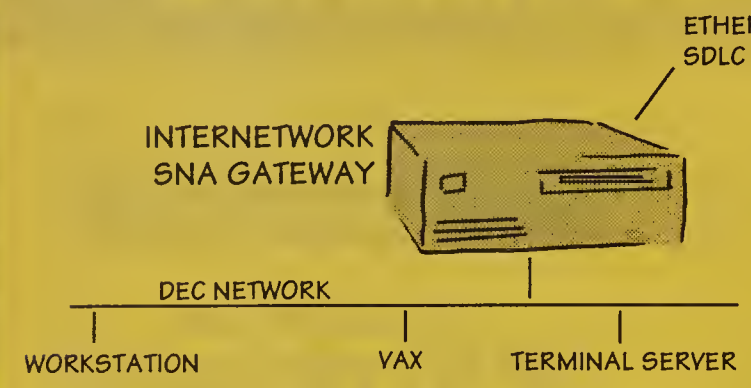

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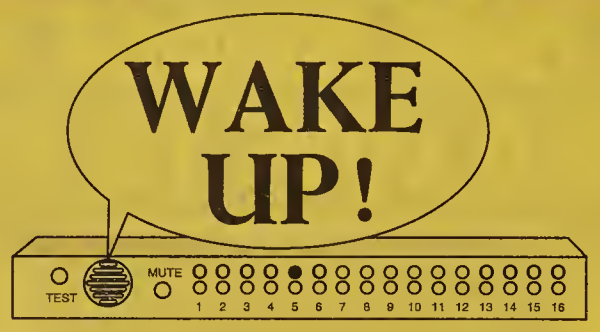

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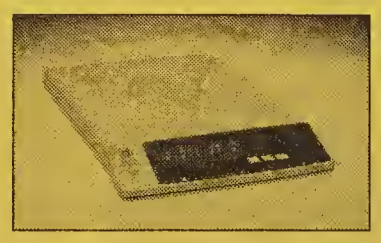

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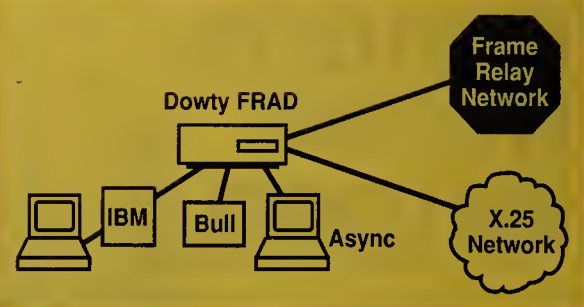

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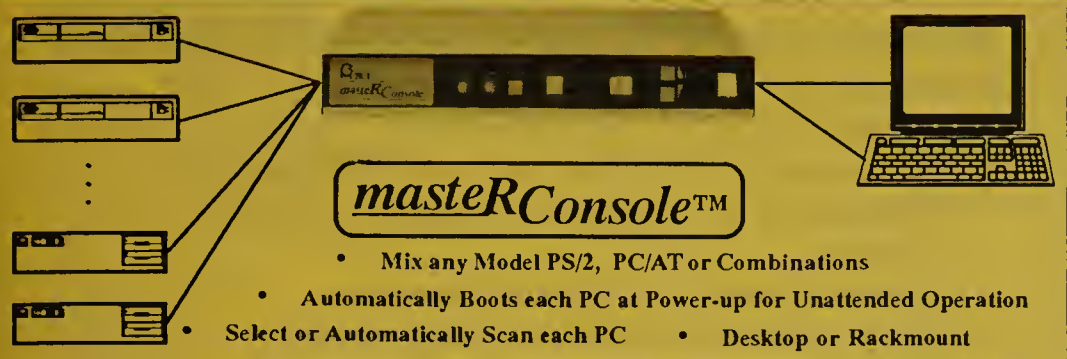

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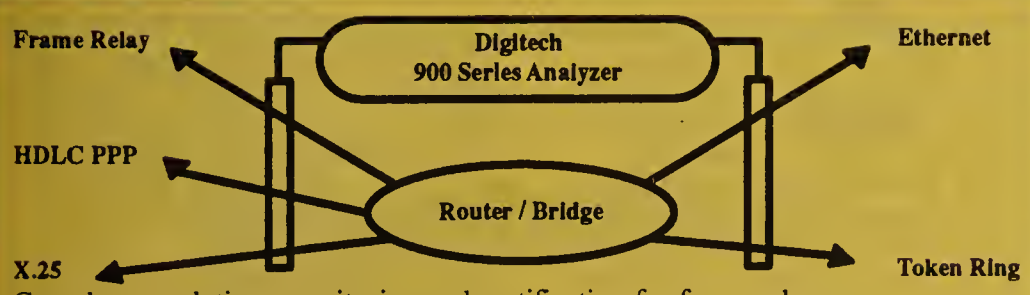

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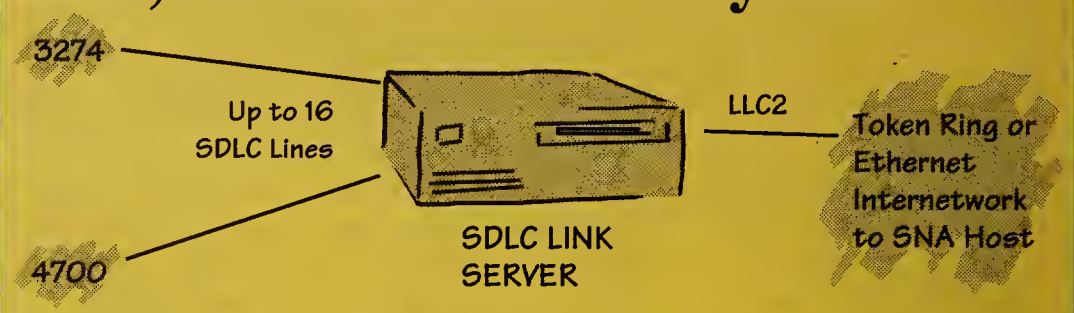

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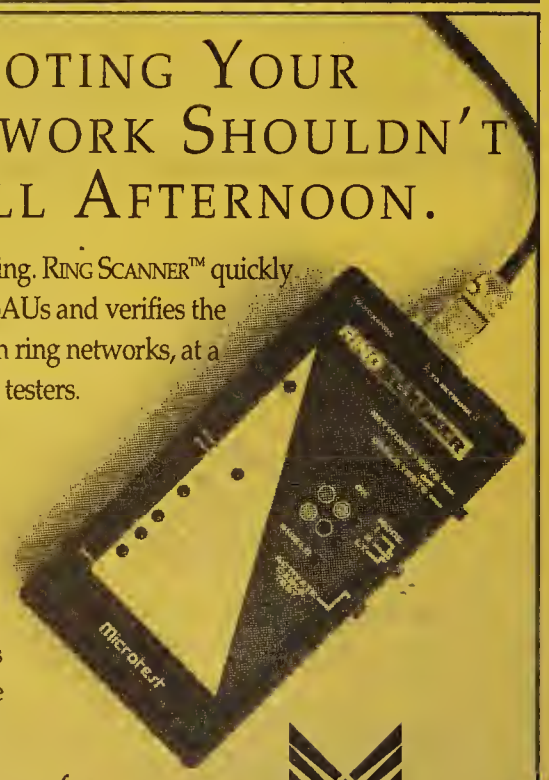

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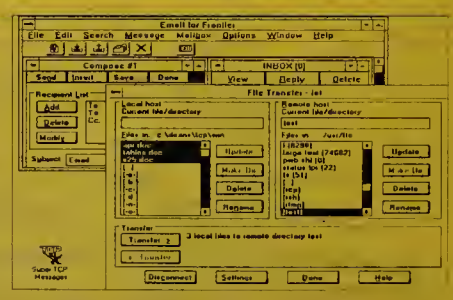

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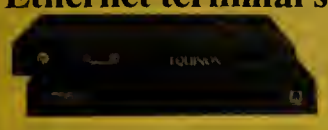

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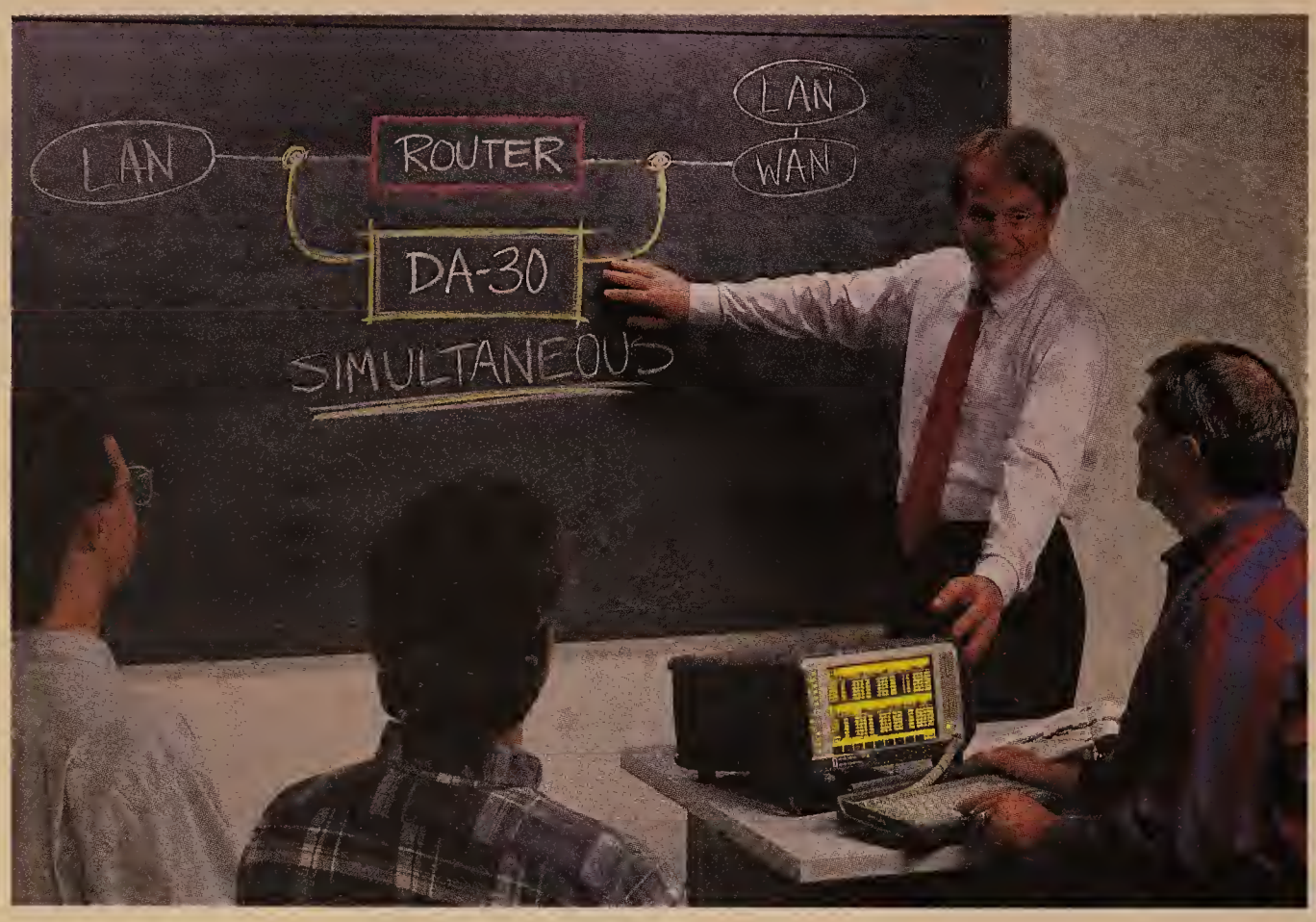

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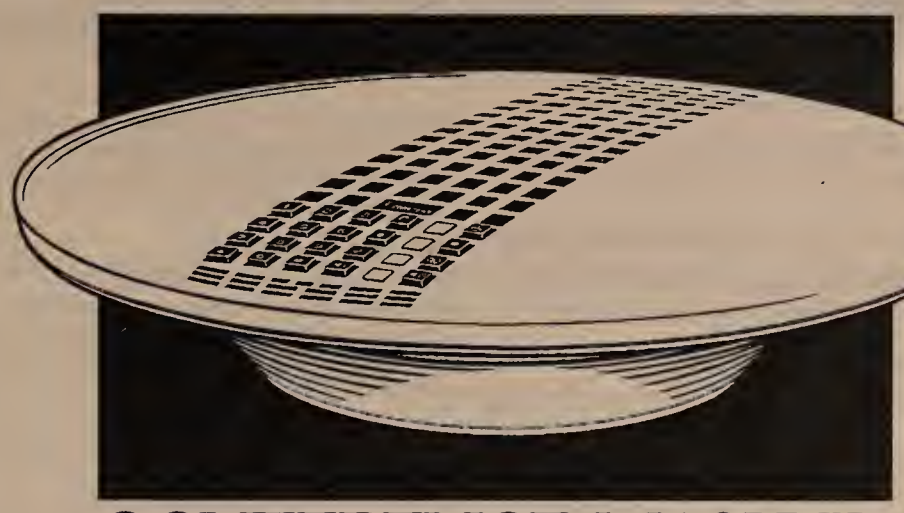

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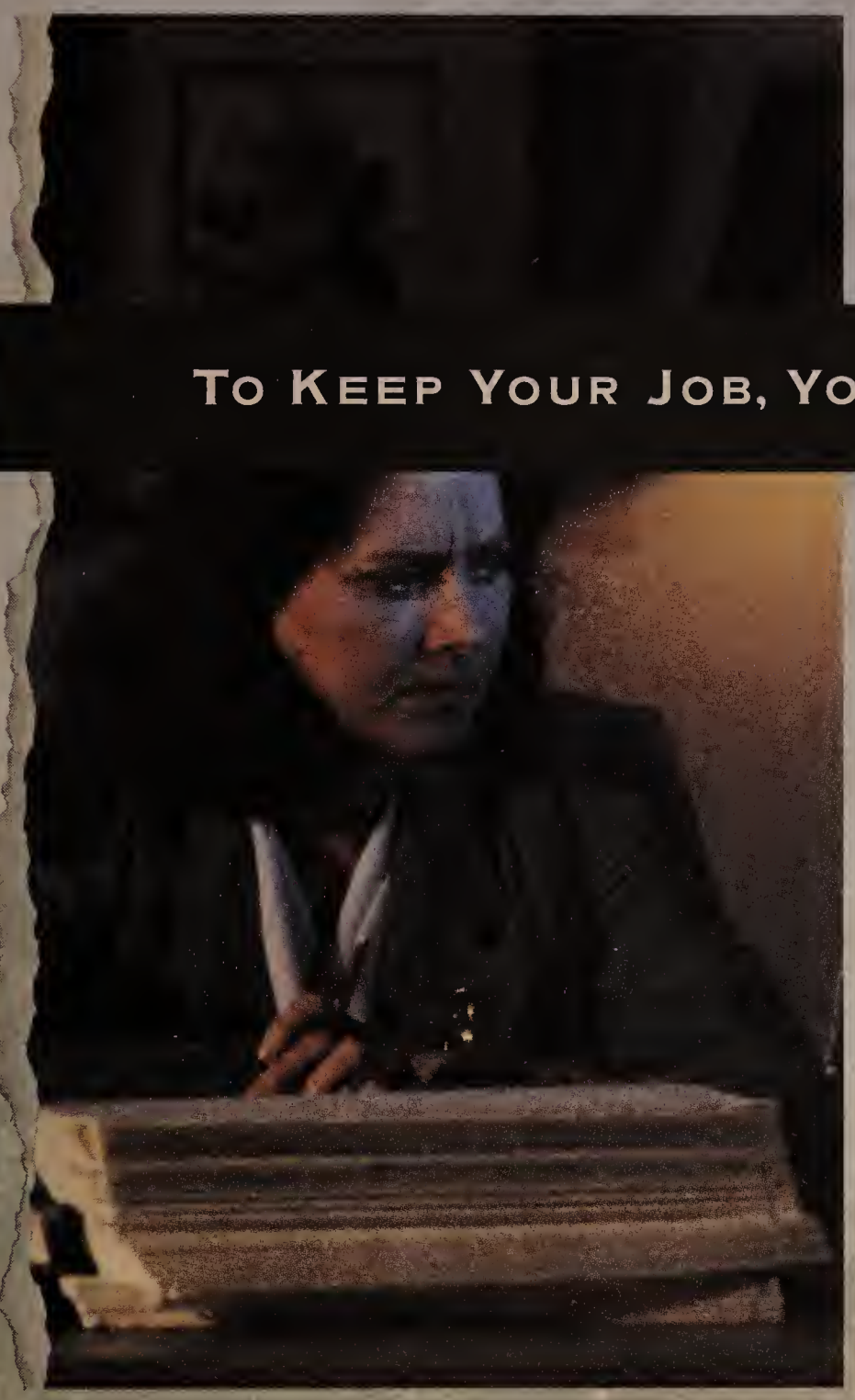

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Factoring in the intangibles

As in any evaluation process, there is more to a product than performance figures alone. This is especially true for frame relay offerings, as vendors are developing products based on standards that are undefined or still being fine-tuned.

User interface

Each switch maker provided a different user interface for its control console. The results of this evaluation category covered the range from relatively easy to confusing and difficult to use.

Of the three switches, Ascom Timeplex, Inc. got the highest marks for a menuing scheme that is similar to those provided with router consoles. Navigating among menuing structures for the setup was relatively straightforward. The need to refer to the manual only sparingly is a credit to its ease of use.

The switch's front-panel LCD also provides valuable status information for each interface module. Its only drawback was that it needed to be rebooted every time a change was made to the setup parameters, resulting in some amount of downtime for the user.

AT&T's BNS-1000 made extensive use of commands for setup, monitoring and maintenance functions. Even though it provided the user with many specific networking details, we had to rely heavily on the manuals and technical support personnel.

Despite the fact that the Telematics International, Inc. switch arrived for the testing preconfigured, the test team found it awkward and difficult to use. The testers got the impression that using the 5601 Stacpac would require specialized training, given its intricate menuing and clumsy command schemes. To its credit, however, it does instantaneously respond and display any reprogramming or reconfiguration changes as they are entered.

User documentation

All three vendors provided the test team with user manuals. They ranged from one manual for the Ascom Timeplex FrameServer to a five-volume set for the AT&T BNS-1000. Telematics' 5601 Stacpac comes with a three-volume set. Each of AT&T's and Telematics' volumes contain about as many pages as the single Ascom Timeplex manual.

Generally, these manuals are well written and organized covering topics from installation and configuration to commands and error messages.

Ascom Timeplex's manual stands out from the rest, if only for its conciseness and ease of use. Given the test team's strict time constraints, this format was especially useful.

On the other hand, the AT&T and Telematics manuals were much more detailed in their approach. Both used extensive examples and detailed descriptions that would be valuable to the user in day-to-day switch management and troubleshooting.

Service hot lines

While configuring the three switches, the test team talked with representatives from all three vendors' technical support staffs. All were well trained and knowledgeable about their switch. Without their assistance, the team would not have been able to complete the testing.

— Stan Fry

Designs make or break switches

continued from page 40

doesn't drop off," Moul says.

Each of the switches handled the 1,500-byte frame size well. However, the Ascom Timeplex and AT&T switches could not handle frames above 1,500 bytes.

The second set of throughput tests took a look at internodal switching. Once again, the FrameSaver fared best.

For 64-byte frames, the Telematics switch transmitted 413 frame/sec before it started dropping frames and continued to have trouble passing the other two frames sizes at acceptable throughput levels. The AT&T BNS-1000 transmitted 1,258 frame/sec before throughput began to decline for 64-byte frames but maintained 100% throughput for the remaining frame sizes.

Because it uses a revamped X.25 platform with its inherent overhead delays, the Telematics switch, had trouble transmitting all the frames offered. Users simply need to be aware of the differences so network performance levels can be matched to switch performance expectations.

Transmission delay

The transmission delay test measured the amount of time each switch needed to receive, process and retransmit frames.

The tests were performed for intranodal and internodal configurations for each vendor using 32-, 64-, 128-, 256-, 512-, 1,024-, 2,048- and 4,096-byte frames. The results represent the raw transmit delay time or "best case" delay without regard to background traffic on the net.

CIR levels were optimized on one DLCI by using the maximum line speed available for each switch: 1.536M, 2M and 2.048M bit/sec for the Telematics 5601 Stacpac, Ascom Timeplex FrameServer and AT&T BNS-1000, respectively.

For real-world networks, switches are generally engineered to handle 70% to 80% CPU utilization while maintaining normal switch processing. These results, then, do not take into account any delays that would result from the normal buffer queuing that can increase exponentially as the number of nodes increase. On the other hand, the transmission delay figures provide users with a model for predicting switch behavior at different traffic load levels.

The test team expected it would take twice as long to transmit frames between two switches as it did to transmit between two ports on the same switch. For the Ascom Timeplex and Telematics switches, this proved true. The AT&T switch, however, passed frames between two switches almost as fast as it passed them between ports on the same switch.

This is at least partly due to the minimal delays on the fiber trunk that AT&T provided with its switch. That fiber trunk supports an 8M bit/sec transmission rate, while the other two switches came with copper trunk cabling capable of supporting 2M bit/sec.

Test team members agreed that if the AT&T switch had been configured with a copper trunk, it would have performed on par with the other switches.

Also, note that the Telematics switch was able to support large frame sizes, making it better suited for file-transfer applications that require larger frames.

Test completed

In this round of the test series, it didn't take long for the test team to see that switch performance and transmission delay varied widely. But this was due primarily to the switches' architectures. And while these varying architectures don't necessarily make any one switch better than another, users need to be aware of their differences.

Cell switches, frame relay switches and reengineered X.25 switches all have their advantages. Users simply need to know how each implements the frame relay standard and the impact that implementation will have on their network's performance.

Cell switches, frame relay switches and X.25 switches all have advantages.

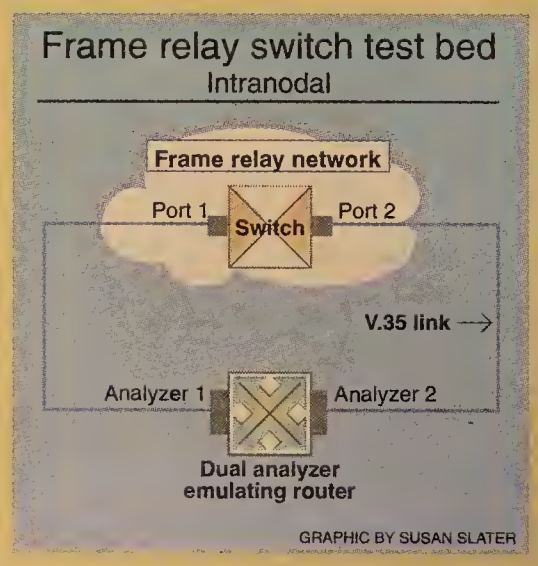
▲▲▲

Users should start their evaluation process by determining their net's load requirements, investigating switch capabilities and focusing on performance needs. In the final analysis, it's only then that they will be able to choose the frame relay switch that is right for their network.

Brown is managing editor of features for Network World. *Fry is a technical writer at W&G, a Raleigh, N.C.-based provider of network analyzers.*

The frame relay switch test bed

To conduct throughput and transmission delay tests, the test team simulated a frame relay network using one- and two-switch configurations for each of the vendors. In each case, the switches were linked via a V.35 interface to protocol analyzers that acted as customer premises equipment.



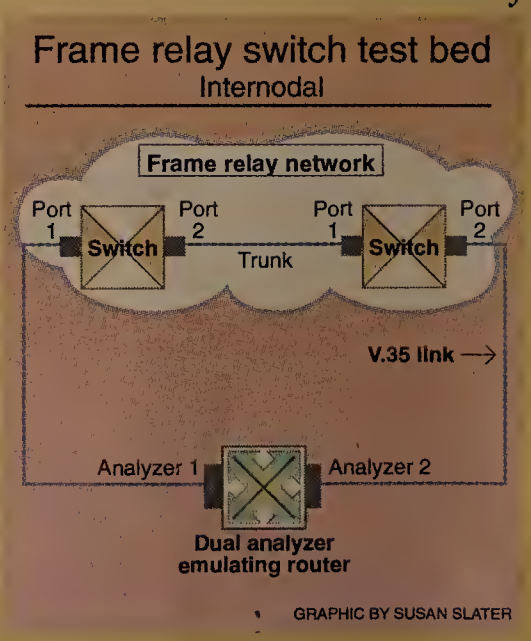
For intranodal testing, the V.35 link was looped through each switch, meaning it went from Port 1 on the analyzer to Port 1 on the switch and from Port 2 on the switch to Port 2 on the analyzer.

In the two-switch configuration, a high-speed frame relay trunk provided the link between the switches. In this case, Analyzer Port 1 was linked to Port 1 on Switch 1. Port 2 on the switch was linked via a trunk to Port 1 on the second switch. Port 2 on the second switch was then linked to Port 2 on the analyzer.

The test experts built the test bed at AT&T Bell Laboratories' site in Warren, N.J. It was set up so that each V.35 link terminated in separate interface cards on Wandel & Goltermann Technologies, Inc.'s DA-30 and Telenex Corp.'s Interview 8800 Turbo dual analyzers.

For most tests, the DA-30 and Interview 8800 performed the tests separately and were used to validate the other protocol analyzer's results.

The DA-30 and Interview 8800 acted as routers, transmitting and receiving frames through the frame relay network. Emulating routers on each side of a switch, the analyzers kept the network alive by transmitting status enquiry requests.



For both the throughput and transmission delay tests, the analyzers used various applications designed by their manufacturers to transmit and receive frames.

— Stan Fry

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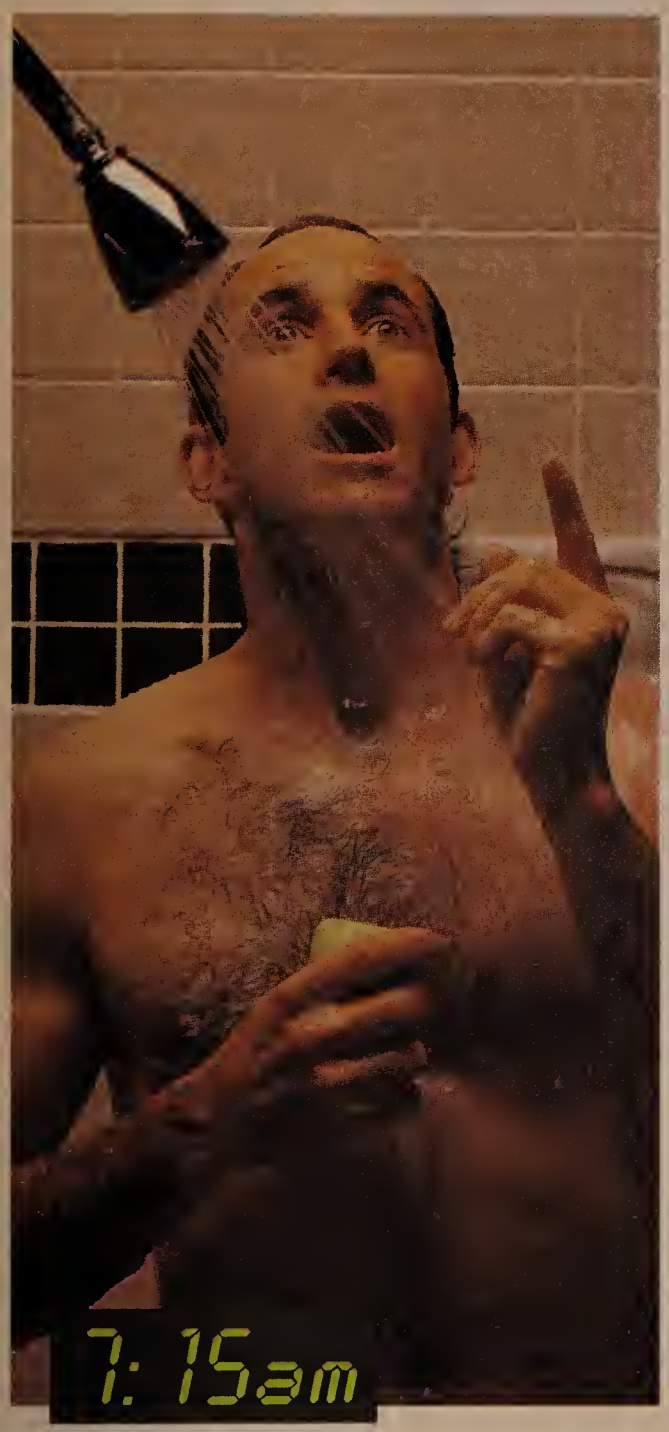

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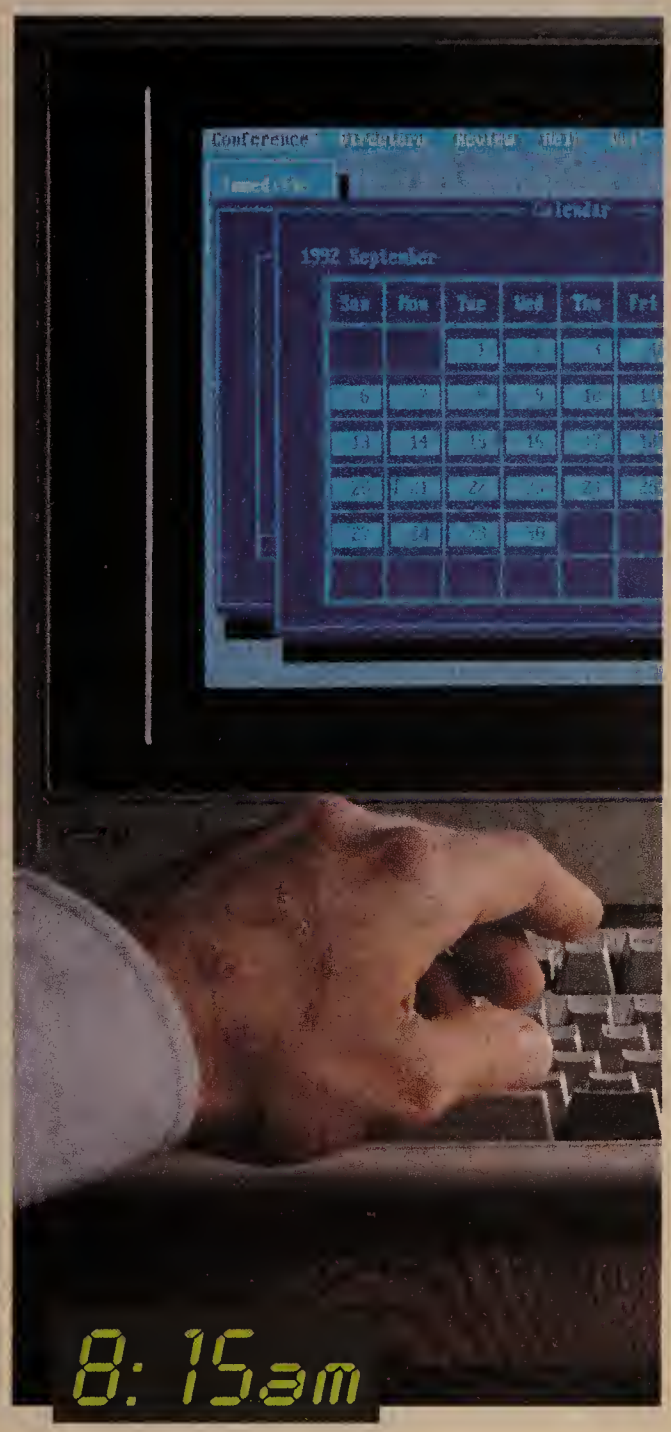

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FCC local access ruling may alter long-haul scene

Choice of new rate model could disrupt industry.

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — The FCC this week is scheduled to launch a fundamental rate restructuring for the local access portion of long-distance calls, a move critics say could turn the industry upside down and drive some long-haul carriers out of business.

The Federal Communications Commission has been considering a number of models for revamping local transport rates, but there is fierce disagreement over which should be adopted. If the FCC chooses the wrong model, access rates for some carriers could grow by two or three times what other carriers pay.

The goal behind restructuring access rates is to ensure that prices are based on the local carriers' actual cost of providing service. Larger long-distance carriers may wind up enjoying volume discounts, while smaller rivals pay significantly higher rates.

Although users almost universally support the idea of cost-based pricing, they acknowledge a downside. A drastic change in the access rate structure could drive out many small carriers in business today.

"Users have an enormous interest in fostering fierce competition for their business," said Henry Levine, a telecommunications attorney representing large users in the financial industry. "It's a question of whether making transport rates more cost-based is pro-competitive or anticompetitive."

James Blaszak, counsel for the Ad Hoc Telecommunications User Committee, agreed. "If the numbers [in the new model] are not economically sensible, it [could have] a potentially serious impact on long-distance competition," he said.

The telephone industry has been operating under the current rate model for local transport since divestiture. At that time, the Modified Final Judgment specified that local telephone companies charge the same unit price for local transport, regardless of the access volume the long-haul carrier buys.

That provision expired Sept. 1, 1991, but the FCC required local carriers to continue charging under the original rate structure until a new one could be decided.

Because access is one of the long-distance carrier's biggest costs — accounting for about 50% of a long-distance call's cost — even a small change in the access rates could drive a carrier out of business.

Both Levine and Blaszak agreed that some carriers could be forced out of business if the FCC is not careful when reformulating access rates.

Levine said it could even impact some larger carriers. "Depending on how the decision comes out, it is conceivable it could pose significant problems for carriers who are in numbers three through 10 [in terms of market size], not just numbers 200 through 300," he said.

Users are generally supportive of changing the transport structure to allow larger carriers to benefit from volume purchases, according to Levine.

"If it's cheaper to buy more, then you should pay less per unit," he noted.

MCI sews up net deal with Canadian carrier group

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — MCI Communications Corp. last week struck a landmark agreement with nine major carriers in Canada under which it will lease its advanced network software to the group and implement a common transborder network.

The nine Canadian carriers involved are AGT, Ltd., BC TEL, Bell Canada, Island Telephone, Manitoba Telephone System, Maritime Telephone and Telegraph, NB-Tel, Newfoundland Telephone and Sasktel. These carriers comprise an alliance known as Stentor, which will serve as a liaison with MCI.

The software MCI is leasing to Stentor, dubbed the Intelligent Network Operating System Software (INOSS), runs on Northern Telecom, Inc. central office switches and is the basis for advanced services such as MCI's Virtual Network (Vnet) and enhanced 800 offerings.

Once the Canadian carriers install the software, users in both countries will have access to a common set of features and capabilities.

Analysts last week said the announcement will be a significant help for users with transborder operations. "One of the biggest problems that all U.S. customers have with Canada is that the only way to extend their U.S. network into Canada is to run private lines," said Daniel Briere, president of TeleChoice, Inc., a consulting firm in Montclair, N.J.

> Analysts said the announcement will be a help for users with transborder operations.
>
> ▲▲▲

In this arrangement, though, Canadian sites could get only a subset of all the dialing and call handling features offered on the MCI net in the U.S.

Douglas Maine, chief financial officer at MCI, said the agreement is important because the carrier originates and terminates more traffic in Canada than any other nation. MCI officials also pointed out that this is the first time a carrier has licensed its network software to another carrier.

Under the agreement, the carriers in Stentor will crisscross their networks with an overlay network built using Northern Telecom DMS-250 switches and will connect that net with DMS-250 switches in MCI's network.

Stentor plans to license INOSS to its nine members. MCI will also set up a billing and ordering system so a common set of services can be offered throughout the U.S. and Canada.

MCI and Stentor intend to have initial capabilities available in the first quarter of 1993, said John Allen, vice-president of global business initiatives at MCI. It will take 18 to 24 months beyond that to roll out all of the features and capabilities.

Stentor will pay a onetime $150 million fee for the INOSS software. There will be no additional charges, but Stentor has agreed to help fund and participate in enhancement research.

Allen said a committee comprising one MCI executive vice-president and one Stentor executive vice-president will be formed to oversee the agreement. If Stentor should decline to participate in an enhancement, MCI would fund all the work. "We would have to make sure that anything we did was backward-compatible with Stentor," he added.

Show-goers get glimpse at SMP demo

By Bob Brown
Senior Editor

SAN FRANCISCO — The Internet community's Simple Management Protocol (SMP) moved a step closer to market reality last week with the first-ever public demonstration of the emerging net management standard here.

SMP, which will be at the heart of the second version of the Simple Network Management Protocol, was displayed at a planning session for the International Symposium on Integrated Network Management (ISINM).

The ISINM group was discussing plans for its Integrated Network Management Showcase, a highly technical network management conference held every two years. It will be held here next April.

The SMP demonstration was designed to exhibit SMP's superior performance over SNMP and highlight its configuration management capabilities.

Steve Waldbusser, one of SMP's four authors and manager of network development at Carnegie-Mellon University in Pittsburgh, conducted the demonstration.

SMP is designed to overcome many limitations of SNMP ("Follow-on to SNMP offers wider mgmt." *NW,* June 22). The new management technology promises to bring Transmission Control Protocol/Internet Protocol management capabilities on par with the functionality of the Open Systems Interconnection Common Management Information Protocol standard.

Among other things, SMP will support communications between management systems and provide a means for bulk trans-

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Windows keeps meter running

continued from page 1

boro Co., a manufacturer of process control systems based here.

According to Puckett, vendors such as Lotus Development Corp. and Hewlett-Packard Co., which also market Windows applications, have been receptive to the idea and are reviewing how this need could be accommodated. "But with Microsoft, we're banging our head up against a brick wall at this point," he said.

Puckett said Microsoft suggested he avoid the problem by buying enough network licenses to cover all his users. "That's not the answer," he said.

"Concurrent licensing is a very effective way to do business today," he added. "Unfortunately, I think this is Microsoft's way of taking advantage of the Windows environment to sell more applications."

Foxboro, which recently finished a Windows evaluation, concluded that if the licensing issue was not straightened out, the company would be unable to afford the move to Windows throughout the corporation.

"We learned we could be spending millions of dollars [for unnecessary licenses] if we couldn't resolve the concurrent licensing issues," he said. "So we basically put a hold on the deployment of Windows throughout the corporation."

Puckett said educating users to completely close applications is not the answer, though. "In the real world, everyone tends to use iconified software because it's like a fast menu pick," he said. "They can bring a program back into memory faster to use it."

Analysts agreed with Puckett's assessment. Steve Meyer, president of Avanti Technology, Inc. in Austin, Texas, said, "If you're running Windows applications over a network, especially big programs like Excel, they take a long time to load. Users get tired of that, so it's easier to leave it [iconified] and ready."

Microsoft agrees but argues that just because an application is iconified does not mean it's idle. Users could be employing Windows' Object Linking and Embedding, which would, for example, enable them to automatically update an iconified spreadsheet when a database was updated. If the iconified application were to time-out in this scenario, data could be lost.

"In the real world, probably 98% of all users will never use that capability," Puckett countered. "The average user can't, won't or doesn't need to use it."

Microsoft said it is currently working on a network application program interface (API) that will enable users to track application usage so they can buy only the number of network licenses they truly need.

"That's the bigger problem, as we see it," said Russell Siegelman, product manager at Microsoft. "If we addressed that, we would make it easier for people to know exactly how many copies they use and need to buy."

Even with the new API, however, users would have to pay for iconified applications.

A better answer, according to Meyer, would be a good auditing

(continued on page 67)

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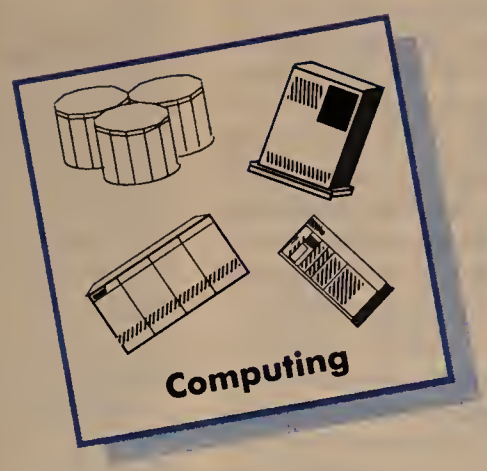

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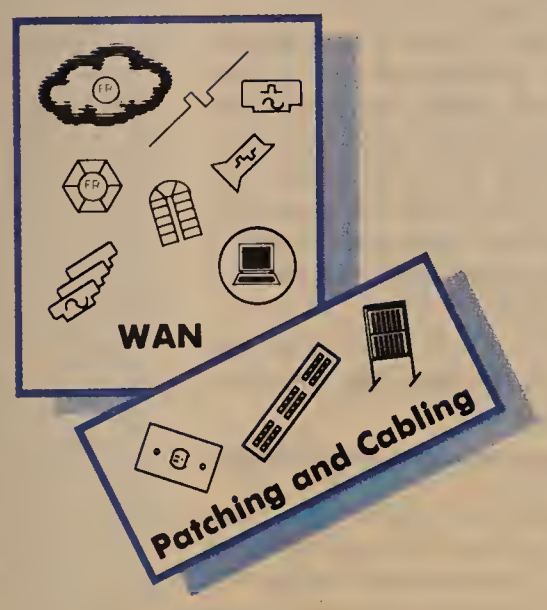

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continued from page 1

The Voice FONCard is designed to give customers access to the network without having to use a card. Subscribers are provided with unique voice-activated authorization codes tied to their social security numbers for easy recollection.

After dialing into the system using an 800 number, callers simply speak their authorization code into the system, which recognizes the code and the caller's unique voice print.

Once identified, the caller can then verbally instruct the system to place one of two types of voice-activated calls — "Call home" or "Call office" — or the person can dial the call manually.

In addition to being easy to use, voice recognition is intended to foil "shoulder surfers," who watch people dial calling card numbers in public places and sell the authorization codes.

However, with the new system, if a crook obtains the caller's code, it is of little use because the codes are tied to customers' voices.

While the card is not yet available to the public, Sprint has been trialing it for more than a year.

Sprint announced in April that about 5,000 callers had made more than 300,000 calls using the card and that the test was being expanded to include 50,000 users. The test is scheduled to run until Dec. 31, at which point Sprint will decide whether to make it generally available.

Easy as 1-2-3

In order to use the system, each caller must complete an initial enrollment session, during which time the system learns to recognize the caller's voice by listening to the code several times.

The system then continually fine-tunes the caller's voice template through use. If the system is suspicious of the caller's identity, it will ask the person to repeat the code. After three attempts, the caller is asked to input a personal identification number.

During our test, it was possible to fool the system in the early stages of this learning process; different people could use the same card to access the network.

> If a crook obtains the caller's code, it is of little use since the codes are tied to voices.
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But Sprint seems to have refined the verification algorithms. When a caller enters his authorization code, the system uses speaker-independent recognition to determine the proper account and then uses speaker verification to match the speaker's voice with the voice print for that particular account.

In general, after the first 20 calls were made with each card, we were unable to fool the system using another person's voice.

Our findings were confirmed by John Morrison, vice-president of Voice Information Services at Sears, Roebuck and Co. in Chicago and a Voice FONCard user for more than a year.

Morrison and 20 or so of his colleagues performed their own tests to fool the system and were unable to do so after an initial break-in period.

"From a security standpoint, the card does the job," he said.

After being cleared into the system, the caller has a number of calling options. Outside of using the key pad to simply dial numbers, subscribers have the "Call home" and "Call office" speed-dial commands determined at the time of subscription. The caller's spoken commands are matched against a speaker-independent voice model, and the call is then routed accordingly.

Here, the system breaks down somewhat. Since the caller's commands are compared against a broader, nonsubscriber-specific voice print, the discrimination is unlikely to be as good. For instance, when the system was told to "Call penguins," the call was connected to our offices.

Overall, the system connected 99% of these speed-dial requests correctly when we were not trying to fool the system but only 71% when we were attempting to cause problems.

In terms of time savings, we had the subjective impression that the Voice FONCard was not a time-saver, and the numbers backed that up.

We measured call completion from the time the 800 access call was answered to the time the phone at the destination point began to ring. For comparison, we performed the same test with a standard Sprint FONCard. The standard card was faster, with an average score of 32.24 seconds vs. 34.12 seconds for the Voice FONCard using the "Call office" speed-dial comand.

The Sprint Voice FONCard does, however, come with features that the standard card lacks, such as three-way conference calling and message delivery. With message delivery, callers can record a message to be delivered at a later date if the line is busy or no one answered, for example. Both of these options are manually operated via push-button inputs.

More detailed test results are described in the accompanying sidebar (see "FONCard receives a good grade," this page).

Users looking at voice recognition technology should not expect more than the technology can deliver today. Morrison said that after the initial testing phase, he has not used the card much.

"It's just about as convenient as using a standard calling card," he said, noting that extra functionality, such as the ability to use voice commands to place calls from a personal directory, would truly enhance the card.

Peter Kenyon, vice-president of information systems at Silicon Graphics, Inc. in Mountain View, Calif., another Sprint beta tester, found the card useful for making international calls from his "hands-free" car phone. Silicon Graphics requires employees to use a calling card for international cellular calls to prevent fraud. But he also pointed out that a personal directory would be an attractive feature.

Voice FONCard could also use a broader range of enhanced features, such as access to information services or international origination.

"We see the business traveler as the prime target for this product and would like to offer that customer a fully featured card, including a 10- to 20-number personal voice-activated directory," said Cindy Anderson, director of Sprint's card marketing.

Finn is an associate and Briere is president of TeleChoice, Inc.

FONCard receives a good grade

TeleChoice, Inc.'s test of the Sprint Corp. Voice FONCard revealed that, under typical circumstances, it works. When we tried to complete the call in a controlled setting, the system functioned correctly 99% of the time.

Our methodology was simple. We placed more than 200 calls on the system, taping what occurred and timing key processes, and we found that:

- After the first 20 calls, the system is extremely difficult to fool. When we would use the card with a different voice, the system asked for an additional personal identification number (PIN). However, the PIN was printed on our cards, so a lost card could still result in fraud. Most of us simply wrote the 800-access number on a separate piece of paper.
- Ambient noise affects performance but only when it is loud enough to preclude a typical phone conversation. The card worked well when used from street pay phones in New York and performed reasonably from speakerphones.
- Beta users wanted a personal directory feature. The "Call home" and "Call office" commands were useful, but any users who would call those two locations frequently would be better served by a personal 800 service. The real power would be a cache of five to 10 numbers that could be dialed via voice command.
- The card had no trouble functioning for people with foreign dialects, colds or other voice-effected conditions.
- We were able to degrade the system's performance when we tried. When we varied speech patterns, spoke unnaturally or said the letter O instead of zero, the system did not perform as well. It is possible that another user group might have greater difficulty with the card; it is not completely idiot-proof.
- Once we got past the gee-whiz aspects of the card, we were inclined to say, so what? Our testers, no matter how happy with the card, have reverted to their previous calling cards. The biggest problem we had was with the hard-to-remember 800-access codes.

— Christopher Finn and Daniel Briere

SMDS poised for show of support

continued from page 2

controllers, front-end processors, routers and mainframes," Millar said.

DSU/CSU vendor ADC Kentrox has a joint product development arrangement with IBM, said Olaf Nielsen, a product marketing manager for the company. He declined to say if the pair is developing an SMDS DSU.

But Nielsen said there is only one technical challenge in modifying DSUs to encapsulate SNA in SMDS.

"Most SNA [data flows] are longer than 1,000 bytes in length, which means that the CSU at the transmitting side would have to chop [traffic] down into 53-byte SMDS cells," he said. "The receiving CSU would have to buffer the data and reassemble it into the longer [packet]. That could cause some delay but is not a major problem."

Customer demand for SMDS will determine general availability of the product, said Millar, who stressed it can be brought to market very quickly.

Analysts said IBM support will legitimize SMDS.

"IBM users constitute the single largest base of SMDS prospects," said Tom Nolle, president of CIMI Corp., a Voorhees, N.J., consultancy. "They typically have lots of fairly large local sites and a WAN linkage between the cities."

Nolle's firm recently surveyed 267 midsize and large corporations on their SMDS views.

Products that provide SMDS support for SNA are coming from other avenues, as well.

At least one vendor, a start-up called NetVantage, Inc. of Santa Monica, Calif., is developing a network access device that will collect data from a number of SNA devices and encapsulate it in SMDS packets. The NetVantage device is due out by year end.

Other vendors are also gearing up to support SMDS.

Frank Gratzer, executive director of broadband data services for Bell Communications Research, last week said SMDSIG has received documents from Apple and DEC that specify a standard means of transporting Apple's AppleTalk and DEC's DECnet Phases IV and V over SMDS.

A source close to SMDSIG who requested anonymity said Novell will soon submit a document that specifies a standard means of transporting its Internetwork Packet Exchange (IPX) over SMDS.

Nolle said the documents "are designed for vendors that want their products to support one or more protocols over SMDS. This outlines what they have to do to make it happen and eliminate interoperability problems."

As more vendors announce support for the service, SMDS interoperability testing will grow in importance.

To address that need, Bellcore last week, as expected, announced plans to begin tests ("Bellcore to test frame relay, SMDS conformance," *NW,* Sept. 7).

Mike Koblentz, Bellcore's director of data communications technical analysis, said his organization will initially test two SMDS protocols: the SMDS Interface Protocol and the Inter-Carrier Interface Protocol, which is used between a local exchange carrier switch and a long-haul carrier switch.

Banyan to tie NetWare with VINES

continued from page 1

products will consist of a basic version of VINES without the file and print services, which will run on a dedicated machine attached to the NetWare server; a NetWare Loadable Module (NLM) or Value-Added Process (VAP) that will reside on the NetWare server; and a terminate-and-stay-resident (TSR) program that will reside on the NetWare client.

The workstation TSR will direct calls made to the NetWare Bindery to the NLM or VAP within the NetWare server. From there, the NLM or VAP will direct NetWare calls to the Bindery and VINES calls to the attached Unix server.

Although this may be a roundabout solution, sources said the three pieces provide interoperability between the two environments without compromising the current NetWare infrastructure.

Users will be able to keep their current NetWare server and run Novell's Internetwork Packet Exchange (IPX) yet still have VINES interoperability, even though VINES must reside on a Unix-based server and uses different transport protocols.

Together, the components will not only give NetWare users access to VINES services, such as electronic mail, it will let them log on to the net once to access a variety of servers and services. NetWare users must now log on to each server they need to access.

The new product will also give NetWare administrators an alternate way to administer their NetWare 2.X and 3.X LANs using StreetTalk. According to analysts, this may pose a threat to the pending release of Novell's NetWare 4.0, the basis of which is a new directory service similar to StreetTalk.

Management differences

Today, VINES and NetWare LANs are administered very differently. NetWare LANs are resource-centric: When users are added to the network, the administrator has to specify the resources and servers they can access. This resource and rights information is kept in each user's NetWare Bindery.

VINES, on the other hand, is user-centric: Under VINES, users are added to the network, the administrator need only add them as members of a particular department and StreetTalk will automatically assign them the same rights as the rest of the department members.

The directory services in the upcoming NetWare 4.0 network operating system, expected to be released by early next year, will work in much the same way.

But Banyan's new product will, among other things, be able to automatically map names within the NetWare Bindery into StreetTalk names. This will let users administer the NetWare LAN as if it were a VINES LAN, using the StreetTalk directory service.

It is this combination of facts that has led some observers to speculate that Banyan's new product will be a viable alternative to NetWare 4.0. With Banyan's StreetTalk for NetWare product, NetWare 2.X and 3.X users will be able to get the type of directory services promised for NetWare 4.0 without having to upgrade to that new net operating system.

"Putting in NetWare 4.0 basically means you'll be starting over," said a VINES third-party developer that requested anonymity. "Banyan is saying, 'If you're going to toss out what you have, look at this; this is instead of moving to 4.0."

Others agreed. "A major advantage of this over NetWare 4.0 is that the user doesn't have to upgrade if they're at NetWare 2.X or 3.X just to get a naming service," said Grace Carr, vice-president of marketing at Syntrex Technologies, Inc., a VINES reseller based in Eatontown, N.J.

No dice

Analysts, however, do not see the Banyan offering as a replacement to NetWare, and some even warned against implementing such a plan.

"Using this instead of [NetWare] 4.0 sounds attractive, but add-on packages tend to be penny-wise and pound foolish," said Cheryl Currid, president of Currid & Co., a consulting firm based in Houston. "You're dealing with a pasted-together technology solution that may cost more hardship than it has to."

According to Currid, a directory service is the center nerve of a network operating system. She warned that it would not be wise to use one vendor's directory service to run another vendor's net.

Others agreed. "The product will do great in strong Banyan shops, but as an enterprise directory service, forget it," said Todd Dagres, an analyst at The Yankee Group, a Boston-based consultancy. "This will be used mostly for point-to-point connectivity. I see it primarily as a gateway between the two environments."

Rollout includes FEP boost

continued from page 2

IBM will also use the off-load technology in new adapters that give the 3745 support for the Enterprise System Connection (ESCON) fiber-optic mainframe channel architecture. ESCON support would let users locate the FEP up to 36 miles away from the mainframe and increase data-transfer speeds between the FEP and the mainframe from 4M to at least 10M byte/sec.

A new release of the 3745's Network Control Program (NCP) will improve its support for frame relay. The current NCP lets the 3745 link to a frame relay net but contains little control over the flow of SNA data.

The new NCP will employ the 3745's adaptive pacing feature, letting the box automatically slow down the SNA/frame relay traffic if wide-area links become congested.

Also expected Tuesday is the announcement of two new intelligent switching hubs based on IBM and Chipcom Corp. technology. Few details were available last week, but the new hubs are expected to come in six- and 17-slot models that support token-ring, Ethernet and Fiber Distributed Data Interface links. The companies are also expected to define how their net management platforms will interoperate.

In July, IBM and Chipcom signed a development, manufacturing and global marketing alliance.

IBM is also announcing more aggressively priced 16M bit/sec Token-Ring adapter boards. The Token-Ring boards are expected to sell for about $500, sources said, whereas current 16M bit/sec boards cost about $800.

On the net management front, new NetView Performance Monitor (PM) software is also expected that will be able to monitor data flows and response times for devices on Ethernet LANs in addition to its existing support for Token-Ring nets.

Sources also indicated IBM will roll out new system and net management features for the AS/400. Details were limited, but IBM is expected to update its Systems Management Utilities (SMU) program, which lets one central AS/400 control a network of other AS/400s. Included will be new features that let SMU perform software distribution, monitor net performance and track configurations.

On the APPN front, IBM is expected to announce a new version of its network design tool that will give it support for APPN networks.

IBM's Network Design and Analysis (NETDA) software is a net design tool that helps users define the best path statements for various subarea net routes.

3Com preps product suite

continued from page 1

Inc., a consultancy in Stamford, Conn. "3Com views token ring as a very strategic environment."

The company, which provides a range of Ethernet networking offerings, has kept details of this week's rollout under tight wraps but is expected to unveil its next-generation hub, which will support token-ring modules.

3Com will also announce a line of token-ring personal computer-based adapter cards. Analysts believe that the boards will be based on National Semiconductor Corp.'s Token-Ring Protocol Interface Controller chip.

Building on NetBuilder

In last week's announcement, 3Com enhanced its NetBuilder bridge/router software with a Version 5.1 release to allow users to route traffic between Ethernet and token-ring LANs as well as perform full token-ring routing. Previously, users could only route traffic between similar LANs and perform token-ring bridging.

"This will give users more options when it comes to bridging and routing," said Bill Erdman, product manager for NetBuilder. "They now have more protocol support and can do token-ring routing, which is a growing requirement in networking."

3Com ported its Ethernet routing code over to the token-ring platform and then merged the two platforms, allowing traffic to be routed between the two media.

The NetBuilder bridge/router comes in two- and four-port versions and can be configured with any combination of LAN and wide-area network interfaces.

The cross-media routing, which is supported across the WAN interface, can only work if the network operating system and transport protocols — Novell, Inc.'s Internetwork Packet Exchange (IPX), for example — are the same on both LANs.

Although testing has not been completed to determine what type of routing performance can be achieved, Erdman estimated that the throughput rate from one type of LAN environment to the other would be approximately 3,500 packet/sec.

Analysts agree that router vendors need to provide these dual Ethernet/token-ring capabilities in their products today.

"As the token-ring market matures, you're going to find [combined Ethernet/token-ring features] becoming more of a must-have commodity," said Gartner Group's McClimans. "We see a large number of users in token-ring environments demanding the Ethernet functionality and vice versa."

3Com also added AppleTalk II and Banyan Systems, Inc. VINES to the protocols currently supported in NetBuilder, including the Transmission Control Protocol/Internet Protocol, Open Systems Interconnection, IPX, Xerox Corp.'s Xerox Network Systems and Digital Equipment Corp.'s DECnet Phase IV.

The new AppleTalk II implementation includes an entity filtering capability that allows managers to isolate resources.

"If you wanted to restrict a work group's access to a particular server on another LAN, for example, you can set up a filter that would prevent entry to that LAN," Erdman said.

> "As the token-ring market matures, you're going to find [combined Ethernet/token-ring features] becoming a must-have commodity."
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The company also bolstered the routing performance of TCP/IP, DECnet and OSI traffic by increasing memory caching and streamlining the routing code to make it more efficient. "We've increased the routing performance by 30%," Erdman explained. "The old release offered 7,000 packet/sec [for Ethernet-to-Ethernet routing], and now we're up around 9,000 packet/sec."

Bridging performance remained the same for both Ethernet and token ring at 10,000 packet/sec and 4,000 packet/sec, respectively.

WAN support

In addition to the new LAN capabilities offered, NetBuilder 5.1 extends the scope of its WAN support by providing bridging capabilities over existing frame relay and X.25 interfaces. The company has also added a Switched Multimegabit Data Service (SMDS) interface that can be used to route TCP/IP traffic.

NetBuilder 5.1 is available now and comes in three versions. The software for bridging only is priced at $250, while the combined bridge/router version costs $750. Support for frame relay, X.25 and SMDS can be added to the combined version for an additional $750.

Senior Editor Caryn Gillooly contributed to this article.

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NCR looking to bolster offerings

continued from page 4

and a user account lockout feature that allows managers to set a limit on the number of unsuccessful logons a user can attempt.

StarGroup LAN Manager 2.1 will also support a feature called persistent network connections. This enables the server to be configured to "remember" the devices such as printers or file servers to which users were connected before they logged off. When they log back in, those connections are automatically reestablished.

For multiprotocol support among LAN clients, StarGroup LAN Manager 2.1 will include a feature NCR calls Dynamic Protocol Attachment (DPA). DPA allows client workstations to load Internet Protocol, IBM's Network Basic I/O System Extended User Interface and Novell, Inc.'s Internetwork Packet Exchange protocol stacks on the server to communicate with other servers or hosts as needed. Since the protocol stacks are housed on the server, DPA does not require the client to store them, freeing up memory for applications, NCR said.

> "This will step us up into the enterprise management environment," NCR's Thomas Roche said.
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"[DPA] allows users to get to what they already have," such as NetWare servers and TCP/IP hosts, "without having to reboot machines," said Jamie Lewis, vice-president of The Burton Group, a consultancy in Salt Lake City.

StarGroup LAN Manager 2.1 will also support, among other features, Microsoft's Remote Initial Program Load (RIPL) service. RIPL enables diskless workstations on the network to boot from the server. It is similar to StarGroup's Remote Program Load Server, which it will replace.

Finally, StarGroup LAN Manager 2.1 will support OS/2 2.0 and Windows 3.1 clients.

Lewis said the new StarGroup features are incremental, designed to keep StarGroup up-to-date with Microsoft's LAN Manager. "They're not ground breaking, but good," he said. "Microsoft has been doing these things for awhile."

The new features on tap for StarSentry, meanwhile, are designed to offer users a single platform for managing LANs and wide-area networks, as well as the systems attached to them, NCR officials said.

"This will step us up into the enterprise management environment," said Thomas Roche, senior product manager for NCR's network and system management.

StarSentry, which NCR resells under an OEM arrangement with NetLabs, Inc. of Los Altos, Calif., supports the Simple Network Management Protocol and the Common Management Information Protocol over TCP/IP networks. It detects faults and alarms, and can be used to perform system configuration management, software distribution, and user and resource administration.

The extensions will include the ability to distribute software to Novell NetWare, IBM LAN Server and Microsoft LAN Manager LANs, as well as IBM SNA networks, company officials said. Today, StarSentry can only distribute software to servers and client workstations on NCR StarGroup LANs.

For retail and financial networks, NCR is planning to extend software distribution and client management capabilities to devices such as point-of-sale terminals, automated teller machines and imaging scanners, according to Joel Zamlong, NCR director of product management.

The vendor is also looking to add help desk support to StarSentry so network managers at a central site can access network administration data on a server at a remote bank or retail branch.

For customers of AT&T's InterSpan frame relay service, NCR is developing an application that will allow users to query a database at an AT&T frame relay management facility. Users can monitor operational status, traffic and performance data on their InterSpan links, Roche said, but AT&T will still be responsible for managing the network.

"Users can look at the information in real time to tell whether applications are tuned right to run with the network," said Tom Nolle, president of CIMI Corp. in Voorhees, N.J.

Finally, NCR plans to expand StarSentry's Computer Manager application to multiprocessor Unix systems. Computer Manager currently monitors and controls the performance of uniprocessor Unix systems distributed across a network. NCR did not provide a time frame for adding the new, internally developed extensions to StarSentry.

OSI spec to spur development

continued from page 4

the technical staff at General Motors Corp. who is also active on the technical review committee of the World Federation of MAP/TOP Users Groups, said the committee last week voted to support IGOSS and align the next release of the federation's specification with it.

Participants in IGOSS are also planning to develop an IGOSS testing process and users' guide.

Users last week said the IGOSS specification would foster a level of interoperability that could drive down costs.

Robin Hunziker, an electronic services engineer in Marathon Oil Co.'s transportation and logistics division, said his company uses a tremendous amount of electrical energy to pump oil through pipelines. Real-time access to information on power availability and prices could substantially lower this cost by enabling Marathon Oil to schedule oil loads when power is least expensive, Hunziker said.

"We want to write programs to access the power utility's database," Hunziker said, adding that a common set of communications protocols is required to make that possible. Government backing of IGOSS might convince vendors to develop the needed OSI products, he said.

Malcolm said the utilities are eager to establish such bidirectional OSI-based connections with their customers.

The three organizations want to take a step in that direction next week by completing the IGOSS draft, but a few points have yet to be resolved.

The security aspects of IGOSS are still under debate, with NIST seeking to have its Digital Signature Standard included ("NIST stumbles on proposal for public-key encryption," *NW,* July 27), an idea that is not uniformly agreeable to those in the industry.

There is also a debate on whether to include an OSI short stack, which is a truncated three-layer version of the seven-layer OSI stack designed to speed processing. The EPRI short stack, used for both local- and wide-area networking, has some commonality with the Manufacturing Automation Protocol/Technical and Office Protocol stack used for local-area networks, Malcolm said.

But because the three-layer stack is proprietary, some have objected to its inclusion in IGOSS. "Some feel that anything less than seven layers should not be accepted," Malcom said.

OSI purists in the groups also objected to efforts to include Switched Multimegabit Data Service because it is a proprietary Bell Communications Research technical specification.

The extent to which network management is to be included in IGOSS is likewise an unresolved subject, according to Mulvenna and Malcolm.

Show-goers get glimpse at demo

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fers of management information — capabilities SNMP does not provide.

In the demonstration, Motif-based SMP management station and agent software, which was designed by Waldbusser and colleagues at the university, was run on a Tadpole Technologies portable Unix computer.

> Waldbusser said the development of SMP is moving right along.
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Waldbusser demonstrated SMP's superior performance over SNMP by polling agents for routing tables. The demonstration showed that an SMP manager could access the data in a Management Information Base about 10 times faster than an SNMP management station, he said.

Waldbusser also showed SMP's configuration management capabilities by using the SMP management station to browse through the parameter data set for a series of network devices. Inspecting such information, in SMP and SNMP parlance, is known as a GET. While SNMP managers can perform GETs, SNMP does not provide as rich an array of information as SMP does, he said.

Making changes to parameters via SMP, known as a SET, will be demonstrated shortly in another setting, he added.

Waldbusser said the development of SMP is moving right along. The Internet community this month is forming an SMP working group, and SMP should be a completed standard sometime between November and March 1993, he said.

Vendors have already begun building prototypes of SMP products using early SMP specifications and prototypes should be on display at INTEROP 92 Fall, Waldbusser said.

Sybase bucks norm with tools

continued from page 1

on the products, but analysts reacted to the news of the upcoming announcements favorably. It is also unclear as to whether Microsoft Corp. will pick up these capabilities in its version.

"It appears Sybase has come up with a unique approach to solving some real pressing problems," said Richard Finkelstein, president of Performance Computing, Inc. "This new technology sounds different from what the other vendors are doing."

The path not taken

The Replication Server represents the first departure for a major database company from the two-phase commit for performing distributed database updates. Sybase and others, such as Ingres, have offered two-phase commit capability for years, but the technology has come under closer scrutiny with the recent introduction of Oracle Corp.'s Version 7, which supports this capability for the first time.

With two-phase commit, all databases in a network have to be able to perform a transaction before it can be committed or completed. But some analysts and users have cautioned that the intermachine communications required to support two-phase commit can strain large nets.

Sources said Sybase is betting that replication will be a more efficient means of handling distributed updates on current networks. Its new Replication Server would monitor database events and, when certain thresholds or time periods have been exceeded, would use remote procedure calls to perform updates across servers. Users will be able to schedule replication on either an immediate or deferred basis.

Some people who have been briefed maintain that Sybase will use its Open Server connectivity product to support replication over the network. Because Open Server supports other vendor environments, users speculate that Replication Server could work beyond SQL Server environments, such as between IBM mainframes running DB2.

> "It appears Sybase has come up with a unique approach to solving some real pressing problems."
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"It looks as if the vendors will be dividing into two camps, with Sybase being almost alone on the replication side," said Aaron Zornes, a vice-president with the META Group in Burlingame, Calif. "We agree with Sybase that over the near term — the next three years — two-phase commit does not make sense for distributed databases."

Replication Server is expected to be in beta test by year end.

The second new product, the Data Navigator, will handle concurrent routing and updating of tightly coupled servers in a cluster environment. That will let users partition large databases over several servers in one location with the Data Navigator performing high-speed transaction updates transparently.

Due to the high throughput that can be achieved in a cluster environment, Data Navigator may support both two-phase commit and replication.

Sources said Sybase has claimed a 10-to-1 performance boost in a tightly coupled server configuration using Data Navigator compared to a distributed database using two-phase commit over conventional net links.

One user, who asked to remain anonymous, compared the product to a high-end Teradata machine that supports database partitioning over many disks in a cluster. But the Sybase product would use more generic servers rather than requiring a specialized database machine.

Although details on the the final product were more sketchy than the others, Sybase is also expected to introduce a multiserver translation gateway called Omni Server that takes queries in Sybase's SQL and reformats them to let users get at data in other SQL databases.

The gateway is different from existing SQL Solutions gateways offered by Sybase because it will support multiple servers and distributed query joins. This product has been in beta test since June.

However, Finkelstein pointed out that a lot can change between the initial concept for a product and the final implementation.

He said Sybase will probably continue making changes to the products until they are formally announced.

Informix adds OnLine NLM version

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servers for client/server environments," said Nurse, adding there was strong customer demand for an NLM version.

Informix is the fifth major relational database vendor — behind Gupta Technologies, Inc., Oracle Corp. and Sybase, Inc., as well as Novell, with its NetWare SQL — to offer NLM support. Other database vendors planning NLM versions of their database servers are Borland International, Inc., XDB Systems, Inc. and Ingres Corp., an ASK company.

"NetWare is fast becoming the operating system of choice for database vendors," said Chris Le Tocq, senior research analyst at InfoCorp in Santa Clara, Calif. "It's not an ideal platform for databases, but it's in place in a vast array of corporations."

Informix's NLM version stores noncharacter data — such as image, audio and oversized documents — as Binary Large Objects (BLOBS) directly in the database. This feature makes it easier for developers to build multimedia applications using Informix because other NLM databases require developers to write SQL queries in order to access BLOBS not stored directly in the database, Nurse said.

The NLM version also has a utility that supports different installation procedures for beginning, intermediate or advanced database administrators, which makes it easier to install the database, especially for companies that will be upgrading from less sophisticated personal computer databases, he said.

In addition, Informix-OnLine for NetWare has a menu-driven monitoring utility that enables NetWare administrators to track database usage without learning a new set of commands.

In its other announcement, Informix released Version 4.1 of Informix-SE, which adds support for Windows clients and NetWare Version 2.2. Previous versions supported only DOS clients and NetWare Version 1.0.

Version 4.1 has a new cost-based optimizer that speeds queries performed on large tables. It supports additional file handles, which let developers build more sophisticated applications by enabling them to open more tables concurrently.

Informix-OnLine for NetWare will be available in October at $4,995 for 16 users, $8,995 for 32 users and $16,995 for unlimited users. Version 4.1 of Informix-SE is available now at $395 for a single user and $2,795 for unlimited users.

Small router has high-end ability

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depending on user needs. One serial, Ethernet and token-ring module could be employed, for example, for offices with mixed-media environments, or one serial module could be used with two Ethernet modules or two token-ring modules. Users may also have two serial modules with an Ethernet or token-ring module.

Users can employ the 4000 to route traffic between Ethernet and token-ring local-area networks provided that the protocols in use are the same on both LANs.

This type of flexibility and positioning will appeal to a wide range of users, according to Fred McClimans, program director for Gartner Group, Inc., a consultancy in Stamford, Conn.

"The 4000 gives Cisco a solid middle-tier offering," he said. "It's a well-timed and well-planned announcement in that users are increasingly asking for more flexible options, especially in the mixed Ethernet-token ring environments."

Although testing has not yet been completed, Gudmundson estimated the 4000 will have a forwarding rate of 14,000 based on 64-byte packets. Figures were unavailable for a filtering rate, while the aggregate throughput will depend on how the router is configured.

Protocol support

The router supports a variety of protocols, including Open Systems Interconnection, Transmission Control Protocol/Internet Protocol, DECnet, Xerox Corp. Xerox Network Systems, Novell, Inc. Internetwork Packet Exchange (IPX), Banyan Systems, Inc. VINES, AppleTalk, Systems Network Architecture's Synchronous Data Link Control and Network Basic I/O System.

Users will be able to employ Cisco's recently announced Advanced Peer-to-Peer Internetwork technology in the 4000 for routing SNA traffic.

The new router also supports the Routing Internet Protocol and Open Shortest Path First routing protocols.

Available next month, the 4000 is priced from $7,600 to $10,900, depending on configuration.

Windows keeps meter running

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tool. "Then, when someone calls saying they can't get into Excel, you can find out who's been using it the longest, call them up and ask if they can close out of it," he said. "But then you end up being a telephone coordinator. It's just a no-win situation."

Meyer suggested that software vendors incorporate a time-out integrated with an automatic program backup feature.

"You could put hooks in there so that after the application was iconified for a certain amount of time, the file would be automatically backed up before it was closed," he said. "But that type of application intelligence is not typically designed into products."

Others say Puckett is not giving Windows its due. "It's worth every nickel for me to have this environment," said Cheryl Currid, president of Currid & Co., a Houston consultancy. "The productivity is worth it, even if we're paying a little more for the software.

"Before anybody starts calling Microsoft nasty names, we should rethink how we're using computers," she added. "I remember walking the halls of corporations where they had large investments in PCs but none of the monitors were on. If Windows turns that around, it's worth it."

NETWORK WORLD

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